RAILROAD GAZETTE

FRIDAY, MARCH 2.

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Contributions.

The Effect of Brakes on Wheels.

GLENWOOD SPRINGS, Col., Jan. 31, 1888.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Coal Branch of the Colorado Midland is a standard gauge line, having 4 per cent. grades for 10 miles. The rolling stock is like that on the main line; capacity of coal cars, 25 tons. The brakes on a car of a loaded descending train were set with a club, and so left. The air brake was also on up to about 14 lbs. all the time, and part of the time on in its full force. The wheels were not skidded. The train ran two miles, stopped for water about 25 minutes, and ran on about five miles further, when a wheel broke on the car mentioned. There was said to be a flaw in the wheel, but not of a character to cause the breakage. The rim of the wheel was said to be blue from the heat to which it had been raised. Is it probable that the setting of the brakes by air, and also by hand, generating great heat in the wheel, was the main cause of the breakage? The point in dispute is whether the use of the hand brake may have been the immediate cause of the accident. Does such use much increase the danger of breakage? The wheels of these trains, generally of about 10 cars, are almost uniformly very much heated in the descent. Is there much danger of wheels breaking from heating under these circumstances?

Incidentally I might mention that the car with the broken wheel broke all connections and rolled off the track. No other car left the track until the cars behind the one derailed closed with the rest of the train. A BRAKEMAN.

[Some comment on this subject will be found in the editorial columns.—EDITOR.]

Bending Rails in Fast Tracklaying.

ABERDEEN, Dak., Feb. 23, 1888.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the inquiry of "F" in the issue of 17th inst., in regard to bending of rails for curves in fast tracklaying, I have had no experience in tracklaying beyond a mile and a half to two miles per day, but have had experience in bending rails for curves where track was laid at that rate.

The rule adopted was, that rails should be bent for all curves of three degrees or over. The engineering department furnished alignment notes showing the degree, length and direction (right or left) of each curve, and the rails were curved in the material yard before being sent to the front, by a foreman who was furnished alignment notes and a table of middle ordinates for each degree and half degree for rail lengths from 24 to 30 ft. The roller rail bender was used for the purpose. The curved rails were loaded on the train so as to come off at the proper point; the Harris track machine being used for laying the track.

The roller rail bender is simply a strong U-shaped steel frame with a grooved roller on each end to fit the edge of the rail head. These rollers are about 2 ft. apart, and run on the outside of the rail. Inside the rail is a third grooved roller half way between the other two. This roller can be adjusted by a screw which has its bearing against the bottom of the U, so that any bend can be given a rail. In operation the machine is placed on the rail; the middle roller adjusted to the proper degree of pressure, which experience readily determines, a 12 ft. centre wrench is attached to a perpendicular rod in connection with the middle roller. Four men give the wrench a circular motion (walk around), and the machine moves along the rail, giving it a true, even bend its entire length.

It occasionally happens that a rail is found which is stiffer than the average, so that the usual adjustment of the machine does not give it bend enough. In such cases the machine is run over the rail a second time, more pressure being given on the middle roller.

Sixty-six pound steel in the heaviest which I know to have been curved with the roller bender. C. A. GOODNOW.

Bridges Over the Missouri.

CHICAGO, Feb. 23, 1888.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of 17th inst. appears a tabulated statement showing the dates for commencing the construction of certain bridges over the Missouri River, also the date on which the first engine went over and the number of days required for the work. In the case of the Plattsmouth, Blair, Bismarck and Omaha bridges this statement is erroneous, and I give you following the correct dates and time:

	Construction begun, bridge proper.	First engine crossed.	Days elapsed.
Plattsmouth, Neb.	Aug. 9, 1879.	Aug. 27, 1880.	383
Bismarck, Dak.	May 12, 1881.	Oct. 18, 1882.	524
Blair, Neb.	Sept. 19, 1882.	Oct. 27, 1883.	403
Omaha, Neb.	Oct. 15, 1885.	Oct. 1, 1887.	715

The work on the Omaha bridge was replacing a single track with a double track bridge, having new foundations and new superstructure. During its entire construction the bridge was in constant use and there was no delay to any trains. This use of the bridge during construction considerably delayed its completion. E. L. CORTHELL.

Continuous Draw-bars.

ARLINGTON, Ill.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There is one advantage of continuous draw-gears which I do not think is sufficiently emphasized. It is the absence of variations in the length of the train, which are unavoidable with the common draw-gears. For example, as a train passes a point of increased track resistance its length is increased by that resistance till the last car passes that point. Then the cars are drawn together again by the elastic draw-springs, ready for a repetition of the performance.

Undoubtedly these oscillations consume locomotive power. Though, in the individual instance this may be inconsiderate, yet as it exists on *all* such tracks, and *all* such trains, *all* the time, the aggregate is worth thinking about.

W. I. WOLFE.

[It is undoubtedly a fact that draw-springs, if properly used, can assist an engine in starting a heavy train. If the engine backs on to the train and compresses the draw-springs the subsequent elongation of the springs will assist in starting the front portion of the train, but as the springs contract, the resistance is increased, with the result that the point of maximum resistance (at which the engine will stall) is reached when the train has moved some 20 or 30 yards. A little reflection will, however, show our correspondent that the elasticity of the draw-springs cannot have the effect of increasing the total amount of work the engine has to perform in hauling a given train over a given road. The springs merely increase the resistance at one point and correspondingly diminish it at another. The effect of draw-springs in varying the resistance when a train is being put in motion were first clearly demonstrated at some tests made on the Chicago, Burlington & Quincy, at Burlington, Iowa, in July, 1886, and were fully described at that time in these columns.*—EDITOR RAILROAD GAZETTE.]

Dead Blocks and Vertical Plane Couplers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your issue of Feb. 10 the remarks of "A Car Coupler Man," and the comments you make thereon.

I agree with you that the standard M. C. B. type coupler cannot be made strong enough if constructed to beused with 6-in. dead blocks, but I fail to find anywhere in "A Car Coupler Man's" communication any mention of dead blocks of that length. Seven in. dead blocks are a standard on some roads. An M. C. B. type coupler *can* be constructed strong enough with a head shorter than the one in the design given out by the M. C. B. Committee.

It is self-evident that the length given *has* developed from one certain coupler, but that same coupler can be successfully and just as strongly constructed with shorter dimensions. The length and form given to the head shows a waste of metal—metal applied where it is not needed. What we object to is the added weight, and, consequently, added expenses.

The position I take is, that dead blocks should not be used *at all*, and that, practically, they will not do the service expected of them.

Will the *Railroad Gazette* please answer the following questions:

What protection are dead blocks to the M. C. B. type coupler when coupling with the common draw-bar?

What protection are dead blocks to the M. C. B. type coupler when two of that type come together with both knuckles closed? M. J. LORRAINE.

[Our correspondent is mistaken in supposing that "A Car Coupler Man's" letter contained no reference to 6-in. dead blocks. That letter stated: "All the improved forms of couplers will work with the standard dead blocks already in use." This standard dead block projects 6 in., as is clearly shown on page 229 of the Annual Report of the Master Car-Builders' Association, to which Mr. Lorraine and other car coupler inventors would do well to refer.

Our correspondent's other assertions are matters of opinion in which the majority is against him. It is significant that the objections to the 9-in. dead blocks do not come from car-builders.

Our correspondent's two questions are easily answered. Dead blocks are, of course, no use unless both cars are fitted; but the same remark applies to the M. C. B. type of coupler. Dead blocks are also of little use when both knuckles are closed, but there is no particular reason why both knuckles should be left closed. If the brakeman wishes to couple the cars one knuckle at least will be open, and if he does not wish the cars to couple, one or other of the knuckles will probably be left open—that is, in the same condition as when the cars were uncoupled.

A means by which dead blocks can be utilized whether two M. C. B. type of couplers come together with hooks open or closed is illustrated in another column.—EDITOR RAILROAD GAZETTE.]

* See *Railroad Gazette*, Aug. 13, 1886, page 559.

The Use of the Stadia in Railroad Surveying.*

BY PROF. J. B. JOHNSON.

II.

PRELIMINARY SURVEY—FIELD WORK.

Assuming that most of the objections to location from a map lose their force when the map is accurate and cheap, we will proceed at once to describe the methods.

A map location consists in making a survey of a belt of country which will certainly include the line, and in making a map of the same in which contour lines, usually at every five feet of elevation, are carefully drawn, and other topographical features represented. The best line is then found from this map, and a corresponding best line is run out upon the ground, differing from the location taken from the map only where this is found to fail to represent all the facts correctly, or where, because of the small scale, the exact position of the line could not be determined with sufficient accuracy. It is in making this kind of a preliminary survey that the stadia is so eminently useful.

The work may be done by magnetic bearings where these are reliable, and this will be assumed in the method here given. The width of the belt surveyed will be greater or less according as the uncertainty in the position of the line is greater or less, but it will be assumed that the full width may be reached on either side from a single line of transit stations.

If rapid progress is desirable and the transit man will make sure of his readings on the station pegs, then with magnetic bearings, only each alternate station need be occupied, as in leveling. This allows no check on bearings, distances and elevations on the main line of stations, whereas if every station is occupied by both rod and instrument, a check may be obtained on all these by reading them again on the back-sights. The method the writer would recommend for an experienced observer would be that where each alternate station is occupied, and this will be described in detail. The reason why needle bearings are recommended instead of traversing is that the errors are small and *not cumulative*, as in a traverse, and also that the needle bearings are as exact as can be plotted, even on a scale of 200 ft. to the inch. Running by magnetic bearings also allows each alternate station only to be occupied, whereas in traversing every station must be occupied by the transit. If the greatest accuracy is desired, as in a survey for a map of the line showing property lines, roads, streets, etc., the work should be done by traversing, all azimuth readings being made on the limb. In either case an inexperienced observer should occupy every station and check all readings by repeating them on the back sight.

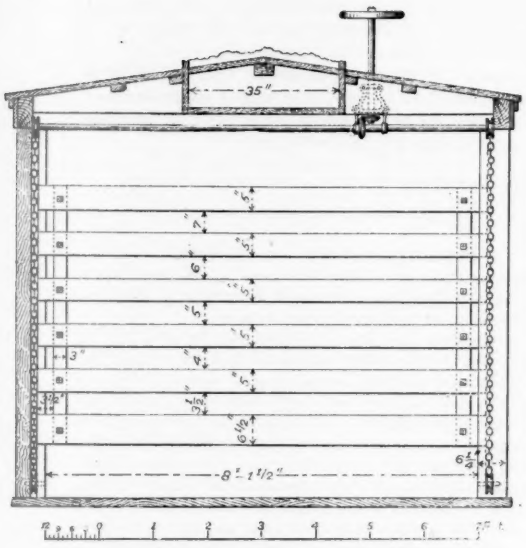
Field Operations—Preliminary Survey; Magnetic Bearings for all Readings; Alternate Stations Occupied.

The line of stations need have no particular relation to the line of the road, when located, except that the belt surveyed is to include this line. No care will be taken, therefore, to get the instrument stations (marked ⊙) and the intervening stadia station (marked ⊡) in line, but both are taken where they will best serve the immediate object in view, the obtaining of a contour map of a belt of country. The instrument stations are selected by the transit man himself, and the position should always be such as to command as much territory as possible and at the same time to command a view of some part of the rod from every point within this territory. Both the ⊙'s and the ⊡'s are well marked by substantial hubs, numbered consecutively, as ⊙ 1; ⊡ 2; ⊙ 3; ⊡ 4; etc., and high marks should be left to enable them to be readily found again. All these stations are points of reference, for both position and elevation, during the period of the survey, and all are to be permanently marked on the map.

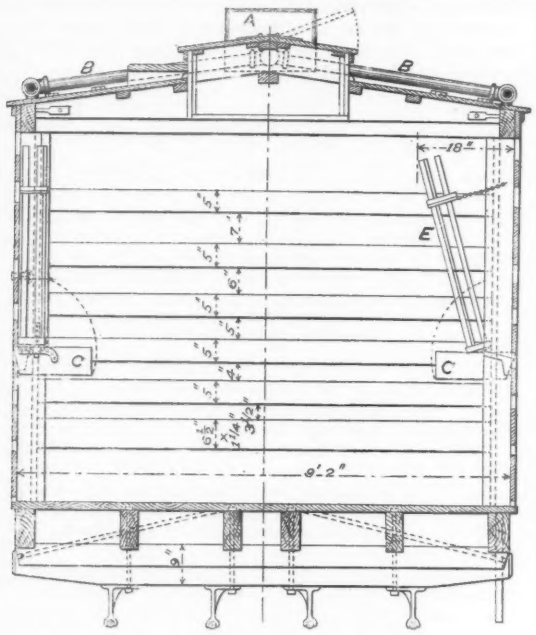
Particular attention must be paid to the adjustment of the vertical circle, so that when the vernier reads zero the line of sight shall be horizontal. This adjustment should be examined at least twice a day, morning and noon. The best way to do this is to occupy *both* the first two stations on beginning work in the morning, and also after dinner, reading the vertical angle between them forward and backward. If these angular readings are not numerically equal, with opposite signs, then adjust the vernier (or the cross wires, if the vernier is not adjustable) for one-half the difference, and *test* it by occupying the third station and reading back to the second. When this is found to be in adjustment within one minute of arc, then each alternate station may be occupied. In case all the hubs are leveled in by the leveling party even this care would not be strictly necessary.

Having set the instrument over ⊙ 1, the "height of instrument" (centre of telescope) above the hub is measured in feet and tenths by means of a small 6-foot staff, graduated to feet and tenths, which is carried along for this purpose. This H. I. is noted in the book for this station, and all readings on rods taken from this station will be taken with centre wire at this reading on the rod, for obtaining the vertical angle. This is then the true vertical angle made by a line

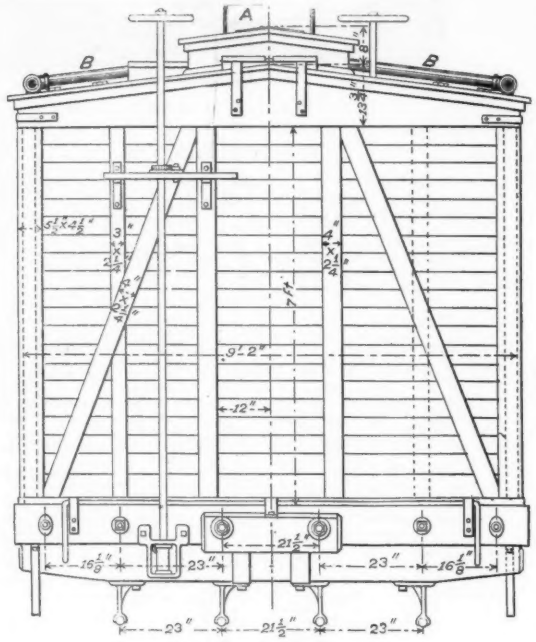
* The first paper of this series appeared in the *Railroad Gazette* of Feb. 3, 1888.



Cross Section, Showing Partition Down.



Cross Section, Showing Hay Racks and Water Troughs.



End Elevation.

THE CANDA CATTLE CAR.

joining the tops of the ⊙ with the point on which the rod is held.

The stadia men now traverse the field visible from the station, holding the rod at each point the position or elevation of which is to be plotted on the map. If our map is to serve only for the location of the line, which would usually be the case, then the main thing is to determine the contours accurately. Most of the points taken, therefore, will be contour points so chosen as to give the greatest possible information when plotted. In addition to these the most prominent landmarks will be taken, such as houses and barns, roads, streams, forest boundaries, rock outcroppings, etc. The positions of streams, gullies or rocky bluffs should be especially well located, for these would exercise an important influence in fixing the position of the line. When all the points visible from this ⊙ have been taken one of the stadiamen sets ⊡ 2 and a reading is taken upon it, when the party is ready to move to ⊙ 3.

A complete reading, whether on a ⊡ or on a side reading, consists of the bearing, the distance, and the vertical angle. Some designation of the point must be entered in the first column. The form of the note book would be as follows:

At ⊙ 151; H. I. = 5.2′ El. = 170.0.

Station.	Bearing.	Dist.	Vert. ang.	Dif. of elevation.	Elevation.	Remarks.
150	N 67° 45′ W	315	−1° 29′	− 8.2	161.8	
Intersec. fences	N 60 40 W	423	−1 40	−12.3	157.7	
Ravine	N 59 50 W	309	−0 59′	−14.7	155.3	To top of rod.
Fence - top of hill	S 40 30 W	357	+5 53′	+38.0	208.0	
Ravine	N 41 50 E	189	−8 30	−27.6	142.4	
Fence—top of hill	S 20 15 E	411	+6 10	+43.9	213.4	
Edge of woods	S 55 35 E	186	+1 35	+ 5.2	175.2	
Fence	N 72 30 E	225	−7 0	− 7.2	142.8	
⊙ 152	N 82 25 E	372	−4 7	−26.8	143.2	

The above notes are taken from an actual survey for the location of a tunnel for the Missouri Pacific Railway.

When the point on the rod corresponding to the height of instrument cannot be seen, the reading is usually taken to the top of the rod, and a correction made accordingly. When a building, or fence, may be taken so as to give an elevation where it is needed for drawing the contours, it appears in the notes only as a fence perhaps, but the elevation is recorded on the map where it is found, to serve as a contour point. The above field notes and office reductions appear on the left page of the note book. On the right page is a sketch, made by the recorder, which shows the relative position of the natural and artificial features of the landscape with reference to the station occupied, containing a few contour lines, drawn in to show their general characteristics, and which will prove helpful when the actual contours are to be drawn on the map. The contour points should be taken *in cross-sections* of the ground, that is approximately in lines cutting the contours at right angles. Thus for a nearly uniform slope, take the top and bottom points along the line of its steepest declivity. In general, take points at all well marked changes of curvature of these lines of steepest slope. The method of taking points along the same contour line, then points on another contour above or below, instead of in cross-sections, may be used if preferred. The observer should so distinctly impress on his mind the appearance of the entire region covered as to be able to recall a mental picture of it when he comes to draw the contours.

The ordinary preliminary surveying party consists of, say—

Chief of party.
Transitman.
Head chain.
Rear chain.
Black flag.
Three axmen.
Leveler.
Rodman.
Topographer.

The work would proceed in the ordinary manner until a region is encountered where it becomes desirable to locate by contours. This party is then reorganized as follows:

Chief of party.
Transitman.
Recorder (topographer).
Three axmen.
Three stadiamen (the two chainmen and back flag).
Leveler.
Rodman.

The head chainman and back flagmen exchange their poles for stadia rods, and if the work is in open country the back flagman also takes a stadia rod. The topographer records and does the sketching, while the leveler follows and finds the elevations of the hubs, which are now the transit stations, ⊙'s, and turning points, ⊡'s. By this means all the party remain employed, and accumulation of errors in the elevations is prevented. If the leveler missed an occasional hub it would be no great matter, since the transitman reads the vertical angles on all sights. If the vernier on the vertical circle should get out of adjustment, however, a comparison of the elevations by level and by stadia would at once reveal the fact, and also furnish the data for computing a correction to all the other vertical angle readings.

If the stadia rods be carried along by the teamster, then at a moment's notice the party may be transformed into a stadia surveying party, and the work proceed *as rapidly as before*. This, of course, presupposes that the party is experienced in this kind of work. It is the writer's firm conviction, based on a considerable experience in the use of stadia methods, that the only real hindrance to its use on railroad preliminary work on rough ground, is the want of familiarity with its methods on the part of our locating and assistant engineers. Until these engineers are taught these methods generally in our engineering schools, the method will probably make slow progress with the profession, for to stop and learn new methods in the field will cost something. It would very often be economical to a railroad company, however, to give its employés the opportunity to learn the use of the stadia. It stands to reason that a method by which points are accurately established in both geographical position and in elevation by simply sighting to them should be in general use by men engaged in that kind of work.

In the next article the reduction of the field notes, plotting, drawing contours, and making the location in the map will be discussed.

The Canda Cattle Car.

The accompanying illustrations represent an improved form of cattle car devised by Mr. F. E. Canda, and made at The Ensign Manufacturing Works at Huntingdon, West Va.

The main object in designing this car has been to obtain a car enabling stock to be transported in comfort and supplied with food and water en route, while on the return journey the car can be used for ordinary freight. The fittings are consequently made to fold up and can be easily stowed away, leaving the body of the car entirely free for freight. The fittings are moreover inexpensive, and the car is of the ordinary pattern, the only doors being in the middle of each side as usual. Numerous side doors in a stock car cause delay in loading, as the car has to be moved so as to bring each door in succession opposite the shoot from the cattle pens. The car is somewhat longer than the usual stock car.

The cattle enter at one of the side doors and are divided into pairs by sliding partitions which resemble the shutters used for front windows of stores. These partitions when not in use, lie under the roof. The construction of the partitions and the method in which they are worked may be described as follows:

The partitions are formed of a series of horizontal slats, stretched across the car and working in grooves in the posts. The slats are connected together by pieces of flat spring steel, which flexible connection permits the slats to fit closely in the grooves and yet pass round the curved guides *D* when being moved by handwheels on the roof of the car. These handwheels, by means of bevel wheels, operate transverse shafts immediately under the roof. These shafts carry pulleys which engage with an endless chain, which is attached at one point to the lowest slat of the shutter or partition.

The arrangement is clearly shown in the accompanying cross sections of the car, and it will be seen that when the handwheels on the roof are rotated in the proper direction, the chain lifts the shutter or partition from the bottom and forces it upward. A curved guide *D* changes the direction of the flexible partition from the vertical to the horizontal, so that when completely raised the shutter lies horizontally under the roof, leaving the body of the car free for the unimpeded exit of the cattle and the loading of another lot of cattle or merchandise. A reverse motion of the handwheel on the roof lowers the partition. The partition, owing to the elastic connection between the slats, is flexible, and yields to the cattle when they are thrown sideways against it by the jerks and shocks of the train. This flexibility saves the cattle the severe bruises and injuries experienced in the common cars now in use.

The hayracks and water-troughs in a similar manner fold up when not required and are also worked from the roof. Four water-troughs are placed in each compartment, so that the cattle can drink whichever way they are facing. These water-troughs, marked *C C* in the illustration, are all supplied with water from a central spout or funnel *A*, placed on the roof of the centre of the car. Pipes *B B* lead from this central spout or funnel to the various water-troughs. The central spout or funnel can be filled by any ordinary hose used for supplying stock with water. The central spout is covered with a door when the train is running, so as to prevent the entrance of cinders. The pipes *B* along the sides of the roof serve also as a safety guard or grab iron to prevent the men falling off the roof of the train.

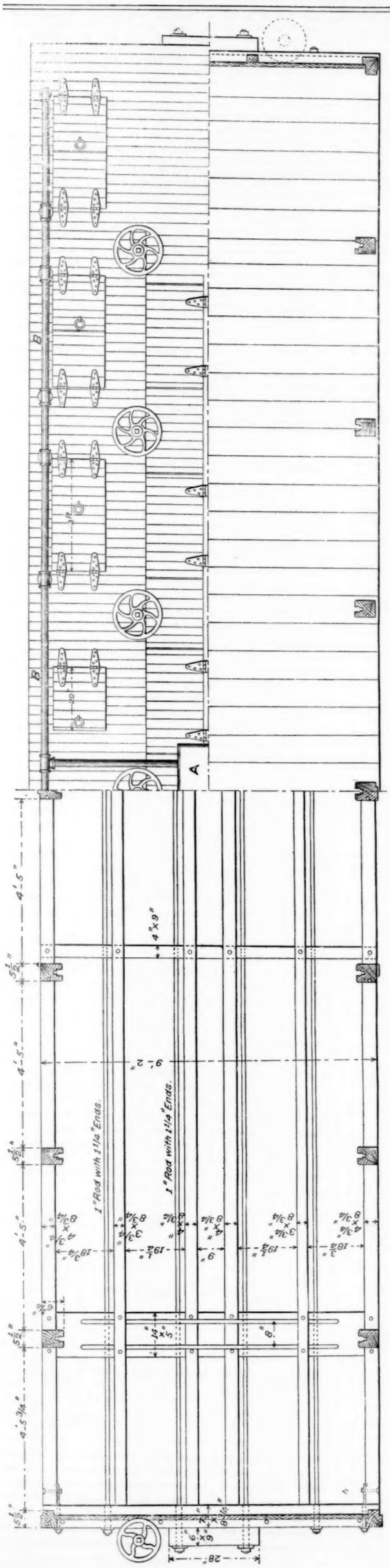
The hayracks *E E* can be filled from the trap-doors or hatches in the roof. These doors are clearly shown in the illustration of the car. The hayracks, when not required, are folded flat against the side of the car.

Some cars on Mr. Canda's plans were constructed some time ago and gave considerable satisfaction. On a trip between Chicago and New York via the Michigan Southern and New York Central route, it was found on careful examination that the average shrinkage in weight per animal loaded in common cars was 53 lbs., while for a similar lot loaded in the Canda cars, the shrinkage was only 32 lbs. per animal, a difference of 21 lbs. per animal in favor of the Canda car. During this trip the train stopped for nine hours at Buffalo and the cattle in the common cars were all unloaded and fed while the cattle in the Canda cars remained in the cars. The train made extra fast time and the consequent shrinkage in weight of the stock in the common cars was not as great as the usual figure, 60 to 70 lbs. per animal. The delay at Buffalo on the other hand was to the disadvantage of the stock in the Canda cars, and it is probable that a diminished shrinkage of fully 25 lbs. per animal may be expected.

Any loss of time for unloading and feeding the cattle on the journey would obviously be unnecessary with a train of Canda cars, as the cattle can be fed and watered en route with little delay. The time occupied in loading one car and putting down the partitions is stated to be three or four minutes.

A train embodying these improvements is now running between Chicago and New York.

It will be observed that the Canda car can be divided into eight compartments or stalls, as shown. As, however, the partitions can be moved at any time while the train is either running or standing, the car can be divided into any smaller number of compartments if thought desirable. Experiments have, however, shown that cattle do best in the smaller com-


Quarter Plan of Roof, Showing Doors for Hayracks and Hand Wheels for Partitions, etc.
Half Plan of Sills, etc.
Half Longitudinal Section, Partitions Down.
Half Side Elevation.
THE CANDA CATTLE CAR.

partments, as they are probably less thrown about by the shocks in working and stopping the train.

The principal advantages claimed for the method of construction shown are as follows:

1. Cattle are fed and watered on board the car in transit.
2. Cattle can be loaded and unloaded quickly and easily.
3. The car can be used for ordinary return freight.
4. The car is but little heavier or larger than a common box or stock car of the same capacity.
5. Moderate cost.

Any further particulars may be obtained of the Canda Cattle Car Co., Wm. P. Robinson, Vice-President and General Manager, of 52 Exchange Place, New York.

Decisions of the Arbitration Committee of the Master Car-Builders' Association.

The following decisions were made by the Arbitration Committee of the Master Car-Builders' Association, at a meeting held in New York, Jan. 26, 1888. There were present Mr. George W. Cushing and Mr. J. L. Rogers, the latter representing Mr. Buchanan:

CASE 1.—Mr. F. B. Griffith (Delaware, Lackawanna & Western) submitted bill from Detroit, Lansing & Northern for wheels exchanged, on which that company charges for two brasses. Former company never charge for brasses put in foreign cars, and ask whether the charge for brasses is a correct one.

DECISION.—At a meeting of the Executive Committee of the Master Car-Builders' Association, held Sept. 16, 1882, it was directed, in a similar case, that "under the rules the (worn) brasses must be replaced by the road having the car in service." The Arbitration Committee concur.

CASE 2.—Mr. J. G. Dennison (Auditor Mexican International) claims that the Missouri Pacific in the case of cars destroyed on its road which had been fitted with air-brakes, declined to allow claims for the value of the air-brake fixtures, claiming to be liable only for the value of cars as fixed by the M. C. B. rules. This action, it was claimed, was supported by the action of the Executive Committee at its meeting of Sept. 16, 1886, when it was resolved that a freight-car, fitted with automatic brakes, "should not be regarded as a car intended for a special purpose, the automatic brake being an appliance which is not of benefit to roads generally, and, therefore, the brake should not be paid for." Mr. G. W. Rhodes (Chicago, Burlington & Quincy) explains the case as follows:

"Aug. 28 the Missouri Pacific Railway Co. gave a bad order for certain repairs to a C., B. & Q. car, including one air-brake hose and coupling. The C., B. & Q. made a bill against the Missouri Pacific, attaching the Missouri Pacific card as their authority for the same. The M. C. B. of the Missouri Pacific Railway Co. takes exception to the charge for it, and quotes the action of the Executive Committee in 1886 as authority for his construction of the interchange rules. (See his letter of Oct. 22, 1887, to Mr. C. G. Warner, General Auditor of the Missouri Pacific Co.) In reply, we explained our interpretation of the Executive Committee's meaning, namely, that it applied to a destroyed car and had no connection with the dismemberment of any portion of the car. We also quoted the action of the Association in Annual Convention at Old Point Comfort meeting as a further argument of our view of the evident intent of the committee.

"The Missouri Pacific Co. still refused to entertain our construction of the matter. We then split up our bill so that the Missouri Pacific Co. might approve that portion of it they took no exception to, and asked them if they would agree to refer this matter to the Executive Committee under Rule 29, and to abide by their decision in the case. To this they have replied as per the inclosed copy of letter from Mr. Samuel Irvin to Mr. C. G. Warner, dated the 28th November. This refusal to allow the case to go before the Executive Committee seems to be a very unwarranted action on the part of the Missouri Pacific, as subscribers to the rules of interchange. In the first place they have used the interchange card authorized by the rules as a means of getting rid of a car on their hands. They next refused to be governed by the responsibilities involved by the use of such card, and finally, when the case is asked to be referred to the authority they quote for their action, they refuse to refer it. It would seem from this that the Missouri Pacific Railway Co. propose to use the M. C. B. rules of interchange, and to quote the action of the Executive Committee, so long as they accrue to the interest of the Missouri Pacific. As soon as these rules come in conflict with their opinions, they repudiate all responsibilities incurred by signing the rules of interchange. It would seem questionable whether such a company should be published by the association as subscribing to its rules another year. We do not care, however, about pressing this point. There have, however, been several other similar cases come to our notice where railroad companies have been misled by the action of the Executive Committee in 1886, regarding freight-car brakes. As their action does not apply to all classes of freight-car brakes, but to a specific class which is operated by air communicated between cars by the means of a hose, it would seem important for the Executive Committee to express the meaning of its action in 1886 in a more explicit manner than has been done.

"For the information of the C., B. & Q. road, we would like an opinion from the Executive Committee or its subcommittee under Rule 29, as to the rights of the case with the Missouri Pacific."

DECISION.—In this case a majority of the Arbitration Committee decided that if a company receives a car with a brake-hose attached, and the car is destroyed, or the hose lost or injured, the company on whose lines the injury is discovered should pay for the damage or loss.

The committee, however, recommend this matter for consideration at the next convention.

Mr. Blackall dissents and says: "I see nothing in the Code of Rules to justify me in agreeing with the above decision. Rule 22 says: 'Refrigerator cars, and other freight cars, designed for special purposes, not specifically referred to in the rules, shall be settled for at special rates as may be agreed to by the parties in interest.' This question does not come within the jurisdiction of the Arbitration Committee to decide."

CASE 3.—Mr. Clem. Hackney (Superintendent of Machinery Union Pacific Railway) submitted the following questions for decision:

In March, 1887, we rendered bill against the Louisville & Nashville for repairs to defective air-brakes under Southern Pacific car which had been carded by the former company for the defects, and in June bill for similar defects on another Southern Pacific car which had been carded by the same company for the same defects. Both of these bills the L. & N. Co. decline to pay, on the ground that they were carded by their inspector in error, basing their refusal on the decision of the Executive Committee of Oct. 15, 1886. We declined to cancel the bill on the ground that a company carding a car cannot refuse to accept a bill based on its own card, and that any company receiving such car would be justified under the rules to make the repairs and render a bill, attaching the card as their authority. The papers were referred back to our Auditor of Disbursements some six weeks ago by me, with request that he forward them to the L. & N. people, requesting them to submit the papers to Executive Committee for decision.

A circular issued by the Joint Inspector of the associated lines at Kansas City to foreman at that point, dated July 23, 1887, states that the Chicago & Alton, Missouri Pacific, Wabash Western and Kansas City Belt refuse to be responsible for loss or damage to air-brakes, or any part of air-brake fixtures on cars so equipped while on their respective lines. This action seems unjust, as any road receiving a car with air-brake appliances should be responsible for them, and return the car with these fixtures in as good condition as when received by them, reasonable wear and tear excepted.

DECISION.—The company carding the car was responsible for the brake to be.

CASE 4.—A pair of new wheels were put under a St. Louis & San Francisco car on the Kansas City, Fort Scott & Gulf, and a bill rendered accordingly. After the car had been returned to its owners, it was found that the new wheels must be taken out, one having a bad crack through the plate. The St. Louis & San Francisco thereupon offered to return the wheels to the Kansas City, Fort Scott & Gulf, supposing that the company could require the makers to replace them with a sound pair, and requested that the cost of the wheels be deducted from the bill, leaving only the charge for putting them under car to be paid. The Kansas City, Fort Scott & Gulf declined, on the ground that the request was not according to the rules, but offered to submit the case to the Arbitration Committee.

DECISION.—If the Inspector of the St. Louis & San Francisco Railway accepted the car having the new wheels under it, that company cannot recover the value of the wheels, if found to be defective, after having passed inspection by their own officer.

CASE 5.—A Pittsburgh, Cincinnati & St. Louis car passed over Columbus, Hocking Valley & Toledo, and was delivered at Toledo to Michigan Central. The last-named company refused to accept it unless carded for defect, said defect being wrong draft-rigging. According to statement the draft-rigging was safe and put on in good shape, but wrong material had been used. From the Michigan Central it appears that the car went eastward carded, finally reaching the Northern Central. On that road it was repaired, the draft-rigging being replaced, and a bill for repairs was rendered to the Columbus, Hocking Valley & Toledo. That company refused to pay the bill, claiming that: 1. Repairs were not made to the car on its road, but the car was received at Columbus with the wrong draft-rigging already on it. 2. A car that has been in a defective condition and repaired with wrong material is not, under the rules, defective. The main reliance was on the first claim. It does not appear that the car was not safe to run, but the Michigan Central Inspector insisted on putting on the defect card solely on the ground that wrong material was used.

DECISION.—The Northern Central has no dispute, except with the Columbus, Hocking Valley & Toledo Railroad. The latter should pay the bill for repairs as carded.

CASE 6.—The Chicago, Milwaukee & St. Paul received two cars from Union Pacific carded as defective for flat or slid wheels. New wheels were put in and bills rendered accordingly. These the Union Pacific refused to pay, claiming that the bills should be for second-hand and not for new wheels. This claim was based on decision of the Executive Committee, Sept. 16, 1886.

The ground taken is, that all that is required is to put the car in as good condition as it was before the defect to be repaired originated. To do this would only require the putting in of second-hand wheels, the use of new wheels being an actual betterment, for which no provision is made in the Rules.

DECISION.—The Chicago, Milwaukee & St. Paul Co. was justified in charging for new wheels, under Rule 12. The committee recommend this matter for consideration by the next convention.

CASE 7.—Mr. N. H. Foster (Auditor Motive Power and Machinery Department Southern Pacific) writes as follows:

We had some new freight cars built in the East, which were shipped from the factory to New Orleans, and freight from the factory to that point paid on these cars. One of the lines over which they were shipped makes us a bill for "inspecting cars." Never before having seen a bill of this character, and knowing of no Master Car-Builders' rule rule touching upon this point, I would respectfully ask if such a charge is necessary in the East. If not, would you be kind enough to give me your opinion as to whether such a bill as this is a proper one or not. Their charge is about 25 cents per car.

DECISION.—A company has no right to charge for inspection.

CASES 8 AND 9.—Mr. J. W. Marden (Fitchburg) and Mr. John M. Ford (Boston & Albany) submitted hypothetical cases regarding oil-box covers and bent axles.

DECISIONS.—The committee do not think that they were appointed to decide hypothetical cases. In case of actual dispute the committee will be glad to make a decision.

CASE 10.—Mr. G. W. Tilton (Supt. Motive Power, Chicago & Northwestern) writes:

"I inclose you herewith two bills of the New York Central, with correspondence, for your judgment. I maintain that 'broken tread' is not a proper charge according to Master Car-Builders' rules, and the New York Central is the only road that has made bills against us for 'broken tread.'

"Since the adoption of the latest rules of the Master Car-Builders' Association we have had many wheels removed on account of 'broken tread' on our road, but never made bills for the same, as the Master Car-Builders' rules make no provision as to 'broken tread' being a proper charge, and other members of the Master Car-Builders' rules do not charge us for this cause of removal."

Mr. Wm. Buchanan (Supt. Motive Power New York Central) replies to Mr. Tilton as follows:

While the rules do not specially permit charge to be made for "broken tread," Rule 9 does allow for charge where wheels are worn out and broken, under fair usage, and this wheel comes under this head. As the piece broken from the tread in this case was 17 in. long, 1 in. wide and 1½ in. deep, it looks very much as though the wheel was a trifle too weak, and, therefore, not a proper cause for us to stand replacement of wheels. Through clerical error the width and depth of break were omitted originally. Please admit the justice of our claim.

DECISION.—The committee considered this case and decided to lay it over, as Mr. J. L. Rogers declined to act in the case. The decision being submitted to Mr. R. C. Blackall, he gave the following decision, with which Mr. Cushing concurred:

As the piece broken from the tread of wheel was 17 in. long, 1 in. deep and 1½ in. wide, the wheel must have been defective and should have been classed as a broken wheel, for which the owner of the car is responsible.

The committee recommend a better definition in the code of rules for a chipped-tread wheel.

CASE 11.—A bill was rendered by the Toledo, St. Louis & Kansas City to the Terre Haute & Indianapolis for $275 for body of T. C. & St. L. car, destroyed in wreck at Waveland, Ind. The car was five months old, and the Terre Haute & Indianapolis claimed that deduction should be made for depreciation, under the rules. To this it was demurred that the rules provide only for yearly allowances for depreciation, and that the car not being a year old, no allowance should be claimed.

DECISION.—The Toledo, St. Louis & Kansas City should make allowance for five months' depreciation, at the rate of 6 per cent. per annum.

CASE 12.—A bill was rendered by the Atchison, Topeka & Santa Fe in September, 1885, for four wheels put in (in place of one wheel with sharp flange and three worn flat) under New Orleans & Mobile car at Argentine, Kan. The Louisville & Nashville, owning and operating New Orleans & Mobile, declined to pay the bill, on the ground that the car had been placed at Henderson transfer on "hoist tracks" belonging to the Evansville & Terre Haute, and that, as that company owned the wheels, it was responsible for the bill.

The Evansville & Terre Haute, in its turn, declined to pay the bill, on the ground that the Louisville & Nashville received all the revenue from the car, and that no benefit whatever accrued to it as owner of the trucks.

The Joint Car Inspector at Argentine, Kan., writes that the initials of the Evansville & Terre Haute could not be seen on the trucks. The car was passed by the marking on the car-body (N. O. & M.) and carded accordingly. The car was received at Argentine from the Wabash, St. Louis & Pacific.

No question was raised as to the correctness of the bill, only as to what company was responsible for its payment.

DECISION.—Under Rule 9, the wheels and axles used to replace those worn out under fair usage will be charged to the company owning the car; and the party owning the car is the one whose interests are in the car-body. Therefore, in this case, the New Orleans & Mobile Co. should pay the bill for the wheels.

Standard Point Switch of the Boston & Albany.

BY C. E. ALGER, DIVISION ENGINEER.

The Boston & Albany R. R. Co. in 1881 adopted as its safety switch what is known as the Lorenz or point switch, replacing the faithful, though clumsy and noisy Tyler. The point switches were purchased of the Ramapo Iron Works and were first used in the Boston yard. The railroad company continued laying these switches during the years 1881 and 1882 in main track connections between Boston and Worcester. In 1883 they commenced to make their own switches at the Springfield shops, using one of the Ramapo switches as a model. The design of the switch rods was changed and the points were altered somewhat, as the points of the Ramapo were found to be too slender. At the close of the year 1883 the railroad was equipped with the point switches from Boston to Springfield.

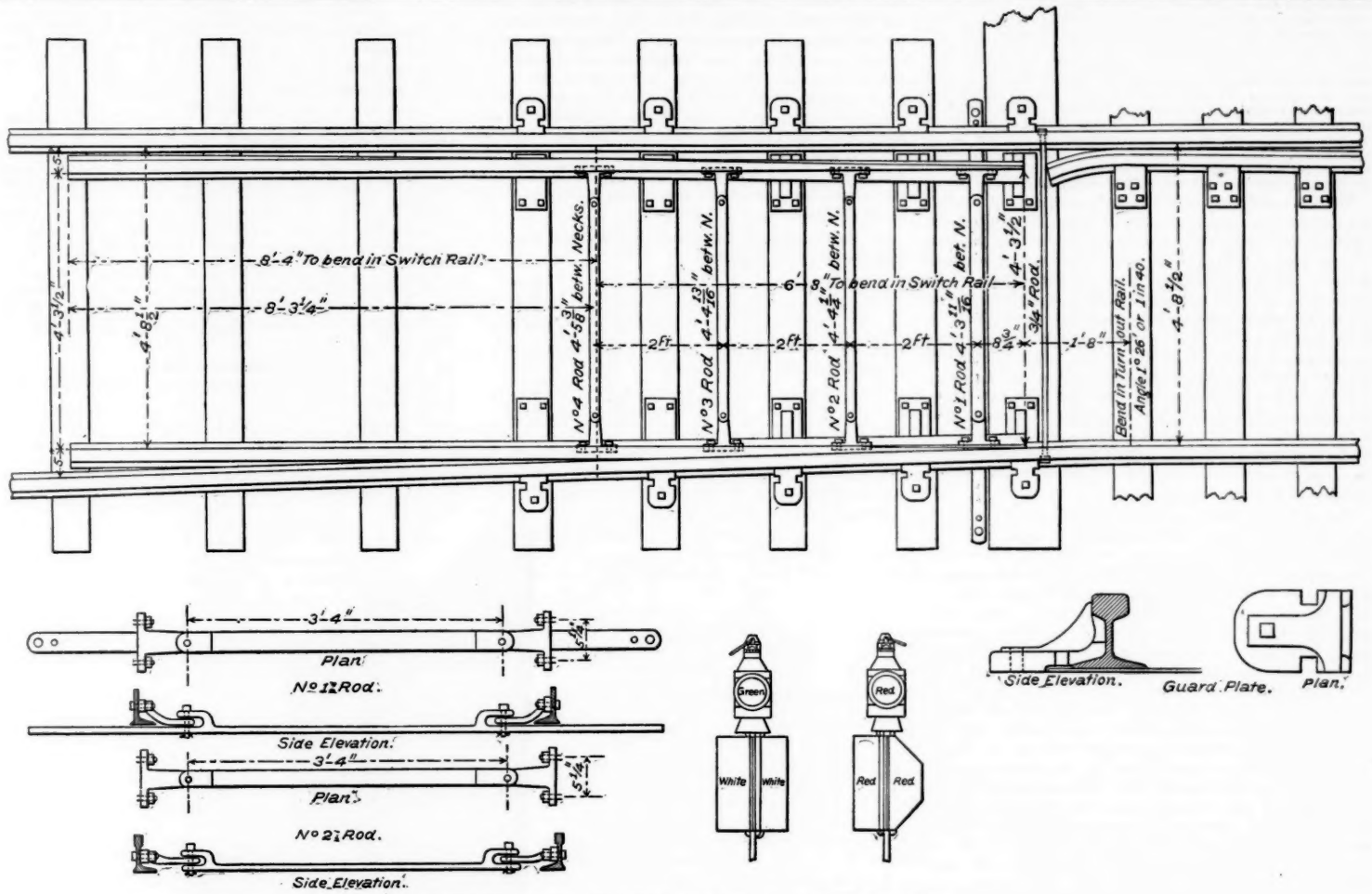
During the summer and fall of this year complaints were made by the roadmasters of this portion of the road that it was difficult to get a good line with the switches made at Springfield. I then examined the switches already in use and found that while we were making a more durable switch yet so little attention was paid to the principles by which the Lorenz switch was designed that the result was an imperfect switch. The rods were uneven in their proportion of length, and the rails imperfect in bend and planing. I also discovered that the trackmen were prone to set the point too near the bend in the turnout rail and were not sufficiently careful in bending the turnout rail. I therefore decided to make a plan, a copy of which I send you, combining such explanations as would warrant better results in the construction of the switches and more particularly to give us perfect switches in the track.

[We have not reproduced Mr. Alger's plan entire. It gives on scales of 1 in. = 1 ft., 1½ in. = 1 ft., and 3 in. = 1 ft., the details which are reproduced in the cut. There is also a sketch on a scale of ¼ in. = 1 ft. showing run for No. 8 frog, on which the relative positions of frog, switch and guard rail are given with all distances carefully figured, viz., 15 ft. from point to heel of switch; 57 ft. 2⅝ in. from point of frog to heel of switch on turnout rail; 52 ft. 7¼ in. from mouth of frog to heel of switch on main rail; 4 ft. 5½ in. from point to mouth of frog, and 7 ft. 6½ in. from point to heel of frog. The chord of the turnout rail is divided into four equal parts of 14 ft. 3⅜ in., and the ordinates are 8½ in. at the centre and 6½ at the quarters, as shown in the following table. A diagram of measurements by which to bend the turnout rail is given, and the following table of ordinates to locate the turnout rail between a No. 8 frog and the standard point switch when the distance between the heel of switch and point of frog = 57 ft. 2⅝ in.:

MAIN TRACK.	Turnout rail.		Centre ordinate.		Quarter ordinate.	
	With curve.	Against curve.	With curve....	Against curve..	With curve.....	Against curve..
			In.	In.	In.	In.
Straight.....	10 deg. curve.	10 deg. curve.	8½	8½	6¼	6¼
1 deg. curve..	11 " "	9 " "	9⅝	7¾	7⅛	5¾
2 " " ..	12 " "	8 " "	10¼	6⅞	7¾	5⅛
3 " " ..	13 " "	7 " "	11½	6	8⅝	4½
4 " " ..	14 " "	6 " "	12	5⅛	9	3⅜
5 " " ..	15 " "	5 " "	12⅜	4¼	9⅝	3¼

The switch target is set to show white when the switch is set for main track and to show red when set for the side track. The beveled side of the target points to the side to which the switch leads. Rods No. 3 and 4 are similar to No. 2.]

This plan does not give all of the detail necessary for complete construction, but compelled some verbal instructions to



STANDARD POINT SWITCH—BOSTON & ALBANY RAILROAD.

the shopmen. The plan does show, however, all that is necessary for good work in the track, and it was with this end in view that it was made. It was decided by the railroad officials that in 1884 the point switch should be placed in all main track connections between Springfield and Albany with the exception of Chatham yard. This place was omitted as certain changes were intended there which would necessitate a repetition of the work if they were put in at that time. These changes were made during 1887 and point switches were then put in. In the winter of 1883 I furnished every section foreman between Springfield and Albany with a copy of the plan, explaining to them that it represented the switch to be substituted for the Tyler switches on their sections during the coming year. This plan was studied by a majority of the men, who made themselves remarkably familiar with it in detail. Mr. F. T. Kendall, Division Roadmaster between Springfield and Pittsfield, paid particular attention to the plan and insisted that the men should follow it in their work. The result at the end of the season was apparent, the switches and frogs on his division being unequaled by any on the road. Perhaps it would be interesting for me to state that this division has taken the prize for the best switches and frogs each year since that time.

I have avoided any extended explanation as to our methods in locating the frog in reference to the switch, as I think that is fully explained on the plan. I will say, however, that I find that the best results are obtained, when using a particular number of frog, by always locating the frog the same distance from the switch whether on a curve or straight line. This increases or decreases the curve in the run as shown by the table, calling the curve of the run out of a straight line ten degrees for a number eight frog, which is practically correct.

In setting up a point switch I have noticed a variety of methods with as great a variety of results. There is one method, however, which if properly carried out will give a good result every time, as follows: Place in position the unbroken or main track rail, carefully lining it, and spiking so much of it as will not interfere with the switch. Place the switch in position and tamp the switch ties and head timber so that they will not move in their beds or settle. Set the point of the switch hard against the main track rail as if set for the side track, tack the point and spike the heel. Erect the gate for this position of the switch, attach the rod, spike the gate to the head timber and spike the brace-plates against the main track rail. Remove the spike from the point and throw the switch by operating the gate. Lay the turnout rail against the point of the switch while in this position and gauge at the heel. Spike the brace plates against the turnout rail and the switch is complete, will throw easily and at the same time will be perfect in fit and not work out of position.

It is the policy of the Boston & Albany Railroad Co. to do away with all facing point switches where they are not absolutely necessary. This rule has been so rigidly adhered to that at many stations where originally each siding could be entered at either end, the switching is now done at one end only. Where yards or sidings are on a heavy grade we are obliged to retain many facing points. All facing point switches have the guard rail as shown on the plan, which may have the effect to direct a loose wheel the proper side of the point. There are at the present time between Boston and Albany 431 point switches in main track connections; of these, 87 are facing points.

Our standard gate is the Tracy, which has a spring in the stand, doing away with the spring in the switch, which latter arrangement is well understood to be a very objectionable feature of any point switch.

The style of target shown has been used since the adoption of the switch. It is not, however, my idea of a perfect switch target. I believe that the best target is the one which shows in its different positions not only a distinct difference in color but also in form.

The frog used in connection with the point switch is a rigid rail frog. The first ones were purchased of the Ramapo Co., and the parts were held together by keys. We now make our own rail frogs, which are 12 ft. in length, 7 ft. 6½ in. from point to heel; angle, 7 degrees, 10 minutes, corresponding to a No. 8 frog. They are fitted with heavy castings, bolted instead of keyed, and give first-rate satisfaction.

I have endeavored, since the adoption of the rail frogs, to determine their weak points, and to this end receive from the roadmasters, whenever a frog is taken out, the cause for removal. From the reports thus received I note the different causes with the percentage in each case: Points worn or battered, 6 per cent.; worn out, 20 per cent.; loose keys, 28 per cent.; wing rails worn, 46 per cent. I am satisfied that where frogs are reported as "worn out," the wing rails are worn more than the point. In fact there are many cases which come under my own observation where frogs have been reversed in position to get the benefit of the wear of both wings. The cause of this excessive wear on the wing rails is due, without doubt, to imperfect wheels.

The Strike on the Chicago, Burlington & Quincy.

On the completion of the arrangement with the Chicago & Alton last week, the officers of the Engineer's and Firemen's Brotherhood turned their attention to the Chicago, Burlington & Quincy, and precipitated a strike at 4 a. m. on Monday, Feb. 27. The Brotherhoods demanded, substantially, the same terms on the Burlington as on the Alton, the schedule as presented by the committee being substantially as follows:

Article 1 provides for a committee of superintendent, master mechanic, and one engineer to investigate and decide on suspensions, discharges, etc. Art. 2 provides that the engineers and firemen shall be called at a reasonable time before leaving time, and stipulates the times from and to which the hours of work shall be computed. Art. 3 has five sections, specifying the various rates for men running passenger engines, four driver and six driver, and freight engines, four-coupled, six-coupled and eight-coupled. Passenger engineers to receive 3⅛ cents per mile, and freight engineers 4 cents a mile on four-driver engines; firemen 2 1/10 and 2⅖ respectively. The rates for larger engines are slightly higher than these; 100 miles to be the minimum day's work. Freight runs occupying more than 10 hours to the 100 miles to be paid extra at 40 cents per hour for engineers and 24 for firemen.

Art. 4. Delays before starting and after arriving at terminals to be paid at similar rates per even hour; any delay less than 1½ hours not to be counted. Art. 5. The minimum passenger pay shall be $3.75 per day for engineers and $2.25 for firemen. Art. 6. Short freight runs of less than 80 miles, when doubled within 12 hours, regular rates; if not so doubled to be allowed one day each way. Art. 7. Work trains and helpers $3.50 and $2.10 per day of 12 hours: if over 100 miles, freight rates.

Art. 8 contains special provision for snow-plow service, suburban trains and weed destroying trains. Art. 9. Switch engines $3 and $1.80 per day of 12 hours, except in Chicago and Kansas City, where 10 hours are to constitute a day at same rates. Art. 11. Hostlers $2.40 per day of 12 hours. Hostlers shall not be required to knock fires. Hostlers to be provided at all terminals. Art. 12 provides rates for running light engines, deadheading over the road, attending court, etc. No engineer or fireman to pull a train without a conductor. Art. 13. Men will run first in, first out, as far as practicable. Art. 14. Rights to regular runs where ability is equal will be governed by seniority. Art. 15. Only a reasonable number of extra men shall be employed. Art. 16. Road men not to do regular yard work at terminals. Art. 17. No fines to be assessed. Art. 18. Men and their families to be given transportation when applied for, and brotherhood men to be passed over the road. * * Art. 20. Road engines to be provided with cracked coal suitable for firing. Company to do all outside cleaning, and where engines are pooled company to do all cleaning. Art. 21. Engineers and firemen shall not be required to go out when they need rest; they to judge for themselves whether they need rest or not. Art. 22. It is understood that there will not be any more examinations or tests, except such as agreed upon by the General Manager and the General Grievance Committee.

The rules heretofore in force upon the road were agreed upon April 1, 1886, and in most of the minor features were similar to those now proposed, though the new ones are more full and explicit. The prices hitherto in force varied on different divisions of the road, and varied for different runs on the same division in some cases.

The company's reply to the men states that the schedule provides for a large average increase in existing rates of pay; and objection is made to the fixing of pay solely by miles run, without regard to hours, weight or importance of trains, or length of service, age or experience of the men. Examples are given where men now working on light passenger or local freight runs would receive 50 to 75 per cent. more than they are now receiving. The existing state and inter-state laws, poor crops, low rates and new competing lines are given as reasons for refusing any considerable advance.

The reply continues: At a time when wages are tending downward enginemen cannot expect more pay, unless they are underpaid now in comparison with other workingmen. Below is a statement of the earnings per month of enginemen on the C., B. & Q. who worked during the whole month, taken from the rolls of November, 1887:

	Engineers.		Firemen.	
	No. men.	Average rate.	No. men.	Average rate.
Chicago division	77	$105.10	94	$55.95
Galesburg division	68	113.56	77	63.34
St. Louis division	31	115.29	37	60.63
East Iowa division	26	110.69	33	58.22
Middle Iowa division	36	126.43	23	76.37
West Iowa division	50	128.76	53	72.51
Average		$115.47		$62.78

Figures are given showing $126 and $138 as the average wages of passenger and freight runners, respectively, on the Burlington & Missouri River, and the fact that few men leave and some of those come back is mentioned. Low pay for the first year, higher for the second and full for the third is in force in other branches as well as among enginemen, but complaints come only from the latter. "To mass all engineers into one body, and to pay all alike, taking no account of superior ability or intelligence, seems

to us unjust and unfair, and in direct opposition to the spirit of the times we live in, which tends to assure each man whatever rewards are due to his own abilities and skill, and not to produce castes, all members of which are on the same level." The company must decide for itself where terminals shall be established and what are the most economical runs for its engines. It must have the sole right to examine, so far as seems necessary, the capabilities and qualifications of its employés. Reasonable free transportation is now given. To pass all members of the Brotherhood as a right is unreasonable. The road expects to pay as much as its neighbors do for similar services, and is ready at any time to take up the question of wages and adjust inequalities.

The first reports indicated that the grievance of the men was chiefly a question of gradation; that, as stated in Mr. Arthur's interview, which was quoted in our last issue, the various grades of wages afforded the railroad a means of keeping men at work for low rates when they deserve to be promoted to a higher class; but from later accounts it appears, as indeed seemed reasonable to suppose from the first, that the real demand is for a considerable increase in most of the men's wages. Mr. Arthur states that he was prepared to make concessions; that the demands as formulated were simply a basis; but that after he had abandoned the higher rate for six-driver engines General Manager Stone refused to discuss the schedule further, and permission to strike was then given. Mr. Arthur states that the men have been long anxious to strike and have been restrained only by his refusal to approve such action.

The strike extended over the entire system, including the Hannibal & St. Joseph, Kansas City, St. Joseph & Council Bluffs, and Chicago & Iowa, but not including the Chicago, Burlington & Northern, apparently. The whole number of enginemen is about 1,600, and less than a dozen refrained from striking promptly at the hour designated. The first day all freight trains were suspended and nearly all passenger trains so far as we can judge by the reports, little information being published from points beyond the Mississippi River. The large suburban passenger traffic at Chicago had to put up with four trains instead of 20 or 30, and one through train was run besides the fast mail. On Tuesday there was considerable improvement, dispatches from various division termini reporting a large share of the passenger trains running; and on Wednesday still further improvement, including a few way freight trains, was reported. Superintendents, master mechanics and other officers who had been runners in former days manned the engines, and a few outsiders were hastily secured. The road promptly issued notices to its connections and the public giving advice about patronizing parallel roads and promising to attend to the needs of non-competitive stations first.

It appears that the road had, in anticipation of a strike, sent agents to New York and Philadelphia to secure men; and the papers of Tuesday, Wednesday and Thursday reported that enginemen by the scores, and firemen, also, had been engaged and sent west. Many of the men sent from Philadelphia and other Pennsylvania points were those who had lost places on the Philadelphia & Reading in the late strike of the Knights of Labor there. Careful agents were sent east, and applicants were quite thoroughly examined before being engaged. On Tuesday notices were posted at all important points that men not reporting for duty by noon of Wednesday would be deemed out of the company's employ.

The strike was generally quiet and orderly, as might be expected of such a body of men; but at Aurora, where a large share of the population of the city is made up of railroad men, the new runners were refused provisions, the merchants being threatened with a boycott if they sold anything to the new comers. The road sent a dining car and provisions from Chicago. A coupling-pin was surreptitiously placed in the guides of an engine in the darkness at Chicago, and a tender hose was reported cut at another point, but it is believed that none of the brotherhood men were implicated. Some new men were dragged from an engine at McCook, Neb. (a division terminus) and some arrests have been made there. A crossing collision at East Clinton, Ill., is said to have been caused by the runner's inexperience, and a slight one at Pacific Junction, Ia., by a malicious engineman. A Kansas City dispatch of Monday reported a "tie-up" of freight engines on the Chicago, Rock Island & Pacific at that point because the men would not haul freight cars which had been transferred from the Burlington road, and the lumber dealers of Chicago, whose yards are mostly on the Burlington tracks, complain that enginemen of other roads refuse to come into the yards to switch out cars, even after the Burlington had offered free use of its tracks.

By Wednesday some of the new men from the East had arrived and been set to work. Large numbers of applicants thronged the offices of the company, but a decided majority of them were fit only for firemen. In view of the time necessary to make the journey from the East and the careful examinations made in every case, it will inevitably be several days before the train service can be fully resumed; but the number of men reported going West increases day by day, and as we go to press the road appears likely to win.

Solid Steel Cast Wheel.

The Pittsburgh Steel Casting Co. has submitted for trial on various railroads a solid steel wheel which has behaved well under drop tests and tests for tensile strength and elasticity. The results of the trials of it which the roads are making have not yet reached us, but results of two series of tests are given below. The wheel is a single plate casting of refined Bessemer steel. The tread and flange are rolled, and it is claimed that perfect form and proportion of those parts are secured, and a truly circular wheel.

Jan. 5 one of the wheels was tested at Reading by Mr. G. W. Cushing, Superintendent of Motive Power of the Philadelphia & Reading. The results are summed up as follows:

A 33-in. wheel, weighing 573 lbs., was tested to destruction by 75 blows from a 140-lb. drop falling 12 ft. and five blows from a 1,250-lb. drop falling 8 ft. At the thirty-second blow of the 140-lb. drop, delivered on the hub, the wheel cracked. After the fiftieth blow the drop was allowed to fall on the plate at the side of the hub, and at the sixty-fourth blow the wheel was turned over, but the cracks were not increased in size. After the seventy-fifth blow the wheel was placed under a drop weighing 1,250 pounds, falling 8 ft. It required five blows of this drop to knock the centre out of the wheel and another to break to rim.

On Feb. 1, 1888, at Pittsburgh, another test was made, with the following results:

No. of blows.	Weight of drop.	Drop.
40	163	12 ft.
10	217	12 ft.
3	280	12 ft.

The web cracked at the fifty-third blow. The test was continued as follows:

No. of blows.	Weight of drop.	Drop.
10	163	12 ft.
11	280	12 ft.

The centre was knocked out at the seventy-fourth blow. The wheel was then placed upright on the rim and was cracked with two blows of a 280 lb. drop falling 12 ft. A test piece cut from the web of this wheel after breaking gave:

Ultimate strength	82,320 lbs. per sq. in.
Elastic limit	41,790 " "
Reduction of area	30.80 per cent.
Elongation	21 per cent in 2 in.

A wheel was tested to destruction by the Erie with a 140-lb. drop falling 12 ft. The test was satisfactory, and the fracture showed a good degree of uniformity. The Erie will put 8 of these wheels in service under a freight engine tender.

The illustration given herewith shows a fragment of this wheel, from which the test pieces were cut. The appearance of the fracture of the rim is fairly well shown in the cut. The fracture is fine grained and apparently very uniform and homeogeneous, although it is not possible to form a very accurate idea from a photograph. The results of the tests are such as to warrant high hopes for the success of the wheel in service.

These wheels are made by the Pittsburgh Steel Casting Co. under the patents of Mr. William Hainsworth, Superintendent. The works are being fitted up with a capacity of 200 wheels per day. Should business demand, that limit can be indefinitely increased. It is proposed to put the wheels on the market at four cents per pound. If the expectations of the makers are realized, there will be not only increase of safety in the use of this solid steel wheel, but economy as well. It is expected that economy will be attained in the superior endurance of the wheel in its original form, and by the fact that when the tread and flange are too far worn to be turned down further, they can be turned off and a tire shrunk on, giving a steel-tired wheel with a solid steel centre.

The quality of the material turned out by these works is well-known and general attention has lately been called to their skill in handling steel by the successful casting of a heavy steel gun. The wheel which they now offer deserves careful consideration and trial because of the works which produce it, apart from the intrinsic importance of the experiment.

SOLID STEEL CAST WHEEL.

Made by the PITTSBURGH STEEL CASTING CO., *Pittsburgh, Pa.*

Wheel Specification and Guarantee.

The following guarantee and specification for chilled cast-iron wheels are used on the New York, Lake Erie & Western, and were referred to in the recent discussions at the New England and New York Railroad clubs:

GUARANTEE.

Wheel to be 5½ in. over tread and flanged and guaranteed for four years' service; to weigh 550 lbs. Each wheel to be marked with 1 in. raised letters and figures as follows: Name of manufacturer on the outside of the wheel; the number, month and year made, on the inside of the wheel; the number to be consecutive, commencing with No. 1 where wheels are first that are furnished by maker. A record to be furnished the New York, Lake Erie & Western on blanks to be furnished by them. Wheels to be well fitted to and pressed on axle at a pressure not less than 60,000 lbs. Gauge for mounting wheels will be furnished. All failures of wheels to perform the service guaranteed shall be settled for on presentation of proper bills by the railroad against the contractors of the cars on the basis of 15 cents per month per wheel for the shortage of service below the guaranteed limit of four years.

SPECIFICATION.

Dimensions and weights must be in accordance with blue-prints furnished.

Wheels are to be marked with 1-in. letters and figures, raised ⅛ in., as follows:

Outside bearing wheels—Name of maker on outside of wheel, date of casting and number on inside.

Inside bearing wheels—Name of maker, date of casting and number on outside of wheel.

Numbers to be consecutive, beginning with number one (1) where wheels are the first furnished by maker. Numbers made vacant by testing or rejection must not be filled.

Treads must be smooth and practically free from "sweat." The depth of clear white iron must not be less ¼ in. at any point, nor more than 1¼ in., nor vary more than ¾ in. in same wheel. The white iron must blend with the gray iron back of it, so that there shall not be a distinct line of demarcation, and so that there shall not be any mottled appearance in any part of any wheel at a greater distance than 1¾ in. from wheel tread. The body of wheel must be of soft gray iron of uniform fracture, and free from defects. Wheels must be capable of withstanding a pressure of 45 tons in forcing on axle.

All chills must have the same internal diameter and uniform cross-section. Wheels will be measured by Master Car-Builder's Standard Tape, and no wheel will be accepted whose circumference differs more than 1½ in. or less than 1 in. from that of the chill in which it is made. Each wheel shall be so nearly circular that a true metallic ring placed upon the tread, and bearing somewhere on the cone, shall at no point be more than 1/16 in. from the tread.

Makers are required to notify the Superintendent of Motive Power when wheels are ready for shipment, and to await arrival of inspector. The inspector will examine all wheels critically, and in whatever manner is found to be most expedient to reveal any defects, and will test representative samples under a drop. He will also weigh a sufficient number to convince him that none are below the minimum weight specified on blue-print.

Makers are to provide necessary facilities and assistance to enable inspector to make prompt and satisfactory examination, and will also furnish wheel drop machine, with anvil block, weighing 1,700 lbs., set on rubble masonry 2 ft. deep.

Wheel to rest flange downward on three supports on the anvil block, not more than 6 in. broad each, and be struck centrally on the hub by a weight of 140 lbs. falling 12 ft.

For each 100 wheels which pass inspection at the foundry and are ready for shipment one representative wheel shall be taken at random and tested as above described. Should this wheel stand 5 blows without breaking in two or more pieces the 100 wheels may be shipped, but should it break in pieces with 5 blows or less, 2 more representing the same 100 shall be tested, and if any 2 of the 3 wheels tested should break in pieces with less than 3 blows, or if the average number of blows required to break the 3 wheels be less than 4, the 100 wheels will be rejected; otherwise they may be shipped, but shipment in any case will be subject to the return of such as are found upon boring or mounting to be below the specifications in any respect.

SUPT. MOTIVE POWER.

Aug. 15, 1887.

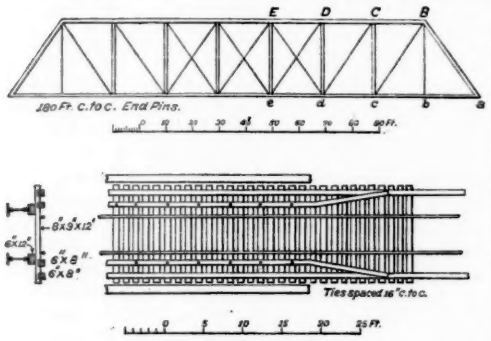
Wreck of a New Iron Bridge.

On the 15th of February a west-bound freight train on the Chicago, St. Paul & Kansas City Railway broke through a new iron bridge. Six cars were wrecked and one man killed. The bridge crosses the Apple River just west of the new station of Trousdale, some miles east of Galena, Ill. It was finished Jan. 15, and was a through Pratt truss of iron, with steel eye bars. The span was 180 ft., centre to centre of end pins. The floor system is shown in the diagram. The transverse floor timbers were 8 in. × 9 in., 12 ft. long, notched down one inch on the stringers and spaced 16 in. centre to centre, giving 8 in. openings. The bolts through the guard timbers seem to have taken clips under the flanges of the stringers.

The specifications for iron bridges on this road provide for a dead weight of 350 lbs. per lineal foot for the rails, ties and guard timbers, added to the weight of the iron in the structure; and for a live load consisting of two consolidation engines, coupled, followed by a train weighing 2,240 lbs. per running foot. The maximum strains due to any position of this live load, and to the dead load, are to be taken to proportion all parts of the structure. The maximum inside strains permitted are: on bottom chords and main diagonals, 10,000 lbs. per square inch; on counter-rods and long verticals, 8,000 lbs.; on bottom flange of riveted longitudinal plate girders over 20 ft. long, net section, 8,000 lbs.; under 20 ft. long, 7,500 lbs.; on floor beam hangers and other similar members liable to sudden loading, 6,000 lbs. The strain in compression of longitudinal plate girders shall not exceed 5,500 and 6,000 lbs., according to length. Compression members shall be so proportioned that the maximum strains shall in no case exceed the following amounts in pounds per square inch:

For members with both ends pin bearing, $1 + \frac{8{,}000}{\frac{l^2}{18{,}000 r^2}}$

where l = length of the member in inches, and r = least radius of gyration of the section in inches. For members with both ends square and with one end pin



and one end square, the co-efficient of r^2 is 36,000 and 24,000 respectively. In all particulars, the specifications appear to have been thorough, and up to good modern practice. We have not the name of the builder, but the Chief Engineer of the road assures us that "the specifications were strictly followed, the inspection at the mills, shops and in the field was done by experts, and the bridge was first-class in every respect."

He further says that "The cause of the accident was a derailed loaded box car striking and breaking the intermediate posts *C c* and *D d* on the down-stream side, and *D d* on the up-stream side (as per sketch attached). The end posts show no signs of having been struck. The car was derailed about 3,600 ft. from the bridge and ran along the track, breaking the journal boxes completely." He does not think that a safety guard rail would have saved the bridge under the circumstances.

A temporary trestle was built around the wreck, so that traffic was resumed in three days, and a new iron span, similar to the one destroyed, will be in place by the middle of March.

Dead Blocks and the M. C. B. Coupler.

Some question has lately been raised as to the utility of dead blocks when two M. C. B. couplers come together with both knuckles closed; and also when an M. C. B. coupler comes against a common draw bar.

As regards the first case, in the type of M. C. B. coupler in most general use, the action of uncoupling leaves the car naturally in a condition to couple, and the action of uncoupling (that is, when the pin is raised by means of the lever) leaves the lever locked in that position until the man wants to couple to another car, when, ordinarily, the only action required is to unlock the lever which allows the pin in the coupler to drop, and it is then ready to couple fast. Hence it is unusual for two cars to come together with both knuckles closed.

A means by which dead blocks can be utilized whether M C. B. couplers come together with the hooks open or closed is illustrated in the accompanying engraving. This shows the M. C. B. coupler fitted with an extra spring placed between the front follower and the coupler. With this additional spring the coupler has a rearward movement in buffing great enough to permit the dead blocks to come together whether the hooks are open or closed. The spring between the front follower and the coupler acts only one way, that is in buffing. In draft it is not brought into action at all, consequently the coupler in *draft* has only the movement attending the use of one spring.

Fig. 1 shows two M. C. B. couplers coming together with both knuckles closed. It will be observed that they are efficiently protected by the dead blocks.

Fig. 2 shows an M. C. B. coupler with knuckle closed buffing a common draw bar. In this instance, also, the couplers are protected by the dead blocks.

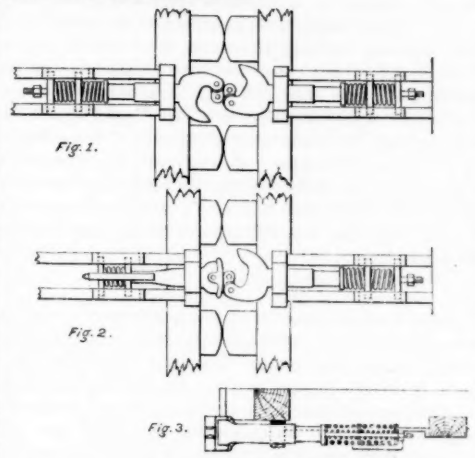


Fig. 3 is a longitudinal section showing the arrangement of the buffing and draw springs.

While such an arrangement will probably be little required in actual service, it is worth while to know that the coming coupler, the M. C. B. or vertical type, can be efficiently protected during the period of transition from the present dangerous style of coupler to the safe and automatic type adopted by the Master Car-Builders' Association.

The Peckham Paper Steel-tired Wheel.

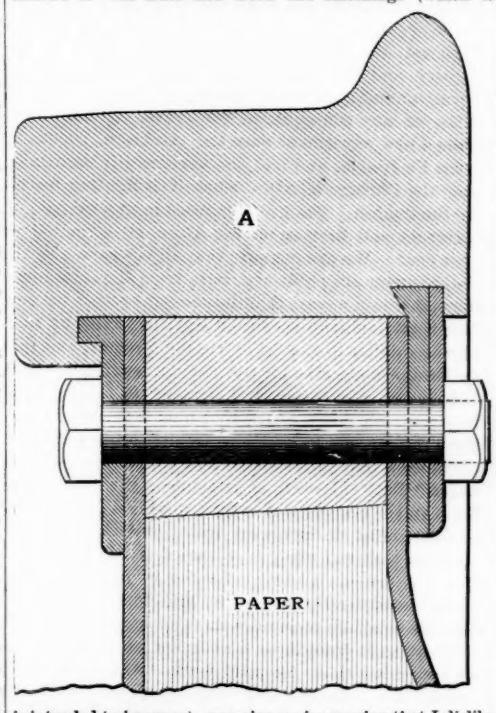
Mr. E. Peckham has requested us to correct some mistakes which appeared in our report of his paper read before the New York Railroad Club, and in the description of his wheel, both of which appeared in our issues of Feb. 24.

The first error is in the address, which should have been given as 239 Broadway, New York.

The Pennsylvania's record of broken cast-iron wheels was given correctly as four-tenths of one per cent. in our article on the Relative Safety of Chilled and Steel-Tired Wheels, and in Mr. Crocker's speech at the New England Railroad Club.* The stenographer at the meeting of the New York Railroad Club reported Mr. Peckham as giving the figure as four one-hundredths of one per cent., or 1 in 2,500 instead of 1 in 250, the correct figure. The erroneous figure appeared on page 118 following the very instructive tabulation of German observations.

Mr. Peckham further says:

"In the description of my paper wheels, by comparing my 'A' tire lock with the Mansell retaining rings, instead of the Bute and Bork tire fastenings (which it



is intended to improve), you give an impression that I dislike to have go abroad. Your illustrations showed only our tire lock 'A,' which is intended as an improvement on the Bute and Bork fastening largely used in Germany. The accompanying cuts show both my 'A' and 'B' tire locks.

TIRE LOCK "A."

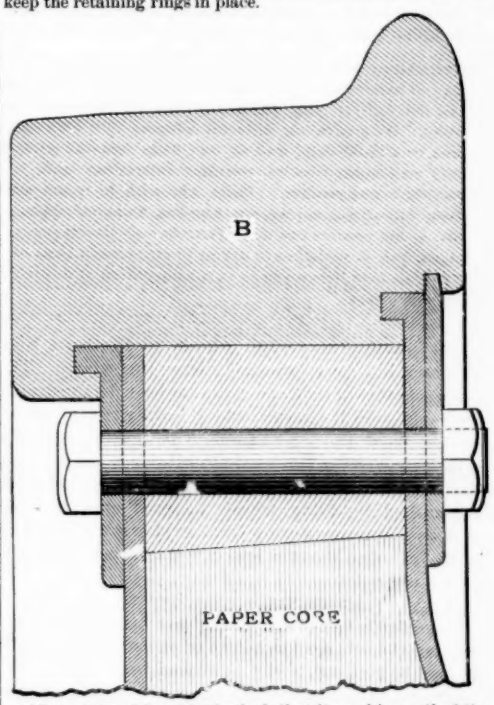
"This tire lock is used to retain the tires upon the paper cored wheel centres in case of breakages. It is intended as an improvement upon the Bute and Bork tire fastenings so extensively used on the German railroads.

"The improvements upon these tire locks is as follows: The tire is provided with a grooved lip on its outer face (the same as used in the Bork tire), and an upper-cut beveled groove on the opposite side of the wheel centre (as used in the Bute tire fastening); but instead of securing the tire to the centre by a projection of the periphery of the wheel-centre on its outer side, and spring rings (secured in place by flanging over the tire) on the opposite side, a continuous wrought-iron flanged retaining ring is used on the outer side of the wheel-centre and double sectional retaining rings (the inner one being beveled to correspond with the bevel of the upper-cut groove) upon the inner side of the wheel-centre. These retaining rings are fitted into the grooves in the tire and bolted to the centre, making a more positive connection than can be obtained by the use of the spring rings, besides giving additional strength and security to the tire and wheel-centre; and when the tire is worn out it can be more readily removed.

TIRE LOCK "B."

"This tire lock is intended as an improvement upon both the Bute and Bork tire fastenings and the Mansell retaining rings, and combines the desirable features of both. The improvements consist as follows:

"The tire is provided with a grooved lip on its outer face (the same as used in the Bork tire), and a groove in and at right angles with its inner face (the same as used in the Mansell retaining rings), and an additional upper-cut groove near the inner face of the tire. Into the groove in the lip of the tire is fitted a continuous flanged wrought-iron ring, and at the opposite side of the wheel centre the periphery of the inner side plate is flanged and fitted into the groove in the face of the tire. To retain the flange of the outer ring and the inner side plate in the grooves, a wedge-shaped sectional retaining ring, is inserted in the upper cut groove in the tire and like the continuous ring on the opposite side is bolted against the side plates of the centre and serves to strengthen it while retaining the tire in place. In case of breakage of tire the strain comes directly upon the inner side plate (and consequently upon the hub). The bolts used serve only to keep the retaining rings in place.



"It is claimed for this tire lock that it combines all of the strength and safety obtained by the use of the Bute and Bork tire fastenings (*i. e.*, additional strength to the tire, obtained by the lip on its outer face, and direct distribution upon the wheel centre of all side strains), together with all of the advantages in strength and safety obtained by the use of the Mansell retaining rings; and in addition, that the tire, being directly secured to the hub by means of the flange connection of the inner side plate, makes this tire lock stronger and safer than either of the aforesaid tire locks."

Any comment on Mr. Peckham's devices must for lack of time be deferred to our next issue.

See *Railroad Gazette*, Feb. 17, 1888, pages 100 and 102.

The Wiley Patent Nut-lock.

This simple nut-lock is strikingly similar to the Verona, the variation from it being to secure greater adhesion to the nut and bar. It is made from ¼-in. square bar steel,

twisted and bent to a warped surface, as shown in the engraving, by a rapid-working machine designed for the purpose. It is claimed for it that the twist in the bar gives the spring an increased strength, and that the cutting edges, being transverse to the line of motion in unscrewing, hold the nut from turning with a tenacity unequaled by any similar appliance. It is already in approved use in the tracks of a number of railroads. As is apparent, it can be made at a low price, a vital consideration in devices of this character. Its agents are the Hoole Manufacturing Co., New York.

Freight House with Hydraulic Elevators at Cincinnati.

The Cincinnati, Indianapolis, St. Louis & Chicago is about to build a new freight house at Cincinnati on a plan novel to this country, and claimed to excel in capacity for business anything now used. Part of the site has been acquired from the Cincinnati, Washington & Baltimore under the compromise by which the Cincinnati, Indianapolis, St. Louis & Chicago surrenders its lot, 56 × 700 ft., on the south of the Central Union Depot, for the extension of the latter, and at the same rate per foot. The new freight house will be on the north side of South Pearl street, 110 ft. deep, and running 700 ft. from Central avenue to John street.

The shed will be along the entire frontage, with a depth of 78 ft. The building back of this will be 32 × 700 ft. and three stories high. It will be substantially built of brick and furnished with hydraulic elevators for the lifting of freight. The plan is similar to that which experience has taught the English railways to be the best. The plans have been prepared by Robt. L. Reed, Constructing Engineer, and it is stated that the entire building will be finished by fall.

RAILROAD GAZETTE

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At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections appointments, and especially annual reports, some notic of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The number of broken wheels in Northern New England has been unusually large this winter. The serious nature of such accidents has been demonstrated by the Haverhill disaster, which is only one of many arising from the same cause. The figures given in a recent issue of the *Railroad Gazette* show plainly that the number of broken wheels can be enormously diminished by using wheels of good quality made under skillful supervision from good materials, and it is to be hoped that the lesson will not be lost on railroad authorities.

Some further correspondence has been received regarding the proposed increase in the standard length of dead blocks, but is not published, as no new arguments are advanced and the opposition to the change is not shown by car-builders, who will probably confirm the recommendation of the Executive Committee, who have very carefully studied the question. It is well to remember that the question of coupler and dead blocks is a question of safety, and that when the lives and limbs of thousands of hard-working men are concerned, common humanity should prompt us to relieve our railroads from an annual slaughter that is a disgrace to us, a nation who boast that we excell in the acts of peace. It has been asserted that in this discussion we have taken no note of the projection of the end-sills in estimating the distance apart of cars. Not only is this untrue, but it should be evident that, as regards safety to the men, the distance apart of cars is measured by the distance between the end-sills, or end platforms when the draw springs are fully compressed. If this distance is materially less than 18 in. the cars cannot be safe on a curve, especially where the truss rod nuts are not recessed. It would be poor consolation for a widow to reflect that her husband was crushed between end-sills and not between the bodies of cars.

The use of some device for showing on some part of a train *its number* for the benefit of station agents, operators and men of other trains would seem to be one of the first things to think of in the present American plan of train running; yet we know of but a single road in the United States that uses anything of the kind, and that one is in New England, where old fogies are generally supposed to dwell. Quite likely there are others, but we do not recall any, and several old officers of whom we have inquired know of none. The Grand Trunk has for years used metallic numbers hung across the face of the headlight, and both that road and the Eastern (Boston & Maine) express great satisfaction with their use. They cost but little, about $2.50 per engine to start with, and but a trifle for maintenance. The Eastern requires the conductor to see that the engineman affixes the number at the beginning of a trip and also has numbers in the turret of the caboose. The Grand Trunk requires engines running light as extras to exhibit their own number prefixed by a cipher (0). Identification of trains by written or oral communication between conductors is a somewhat onerous practice to keep up properly, and if it is likely that the display of numbers as employed by the roads named can be safely used as an aid to the abolition of the practice, the experiment is well worth trying. The Grand Trunk places entire dependence on the reading of these displayed numbers for identification of trains. Another thing done in Upper Canada is, the running of extras and sections without a flag of any kind on the engine. Possibly the use of metallic numbers is one of the features that enables this to be done and that it could be made a means of economy by reducing the expenditure for white and colored flags and lamps.

Judge Cooley is quoted by the newspapers as calling attention to a most serious possible danger to the stockholders from wars in rates like those now in progress in the West, the danger that the present war rates may be cited as permanent standards of charge: "We are required by law to fix reasonable rates, and how can we deny that rates fixed by the railroads are reasonable for those railroads?" We have some doubts whether Judge Cooley really said this; partly on general grounds, partly because in his decision in the case of Crews et al. *vs.* Richmond & Danville, two weeks ago, he took a radically different position. But whether he said it or not, a great many other people will. It is these extremely low rates which give force to every agitation for compulsory reductions in charges. "If you found it for your advantage to make these rates once you can do it again" is a difficult argument for the railroad men to answer. They know it is not sound; but it requires some knowledge of railroad business and no little care in reasoning to see just exactly why it is unsound. It is not to be expected that the members of a state legislature will have the technical knowledge or give the necessary care to enable them to see the fallacy—especially since it is so often for their immediate personal interest not to see it. The only safe way is to prevent the matter from coming up in this form.

The strike of the locomotive engineers and firemen on the Chicago, Burlington & Quincy has attracted very widespread and interested attention. "The Burlington" is one of the largest and strongest systems in the country, controlling five or six thousand miles of road, and has had an excellent reputation as regards the treatment of its men. The Brotherhood is by far the strongest and most respectable trade union in the country, and has been universally praised for its conservatism and good sense, having been engaged in no strike of any consequence for years. It has lately made a new agreement with the Atchison, Topeka & Santa Fe system, and has just successfully demanded from the Chicago & Alton what it is fighting for on the Burlington. The gross increase in money paid to engineers and firemen on the Alton is estimated at 5 per cent. We are not sure that all the causes of the disagreement are published, but, from the statements made, it would appear that the company resists the new classification chiefly because it equalizes rates by *raising* the smaller to a level with the greater, and that the Brotherhood asks for the change because it wants these lower rates raised, and because it thinks, from its success on other roads, that now is the time to demand the change. Indeed, Mr. Arthur's latest published utterance is that "the strike is now simply a question of wages." Both sides talk of principles; the men laying stress on the necessity of a fully qualified engineer on even the most unimportant train, and the company claiming that the *work* is so varied on different runs that the present variety of rates is justified. The Brotherhood itself employs the principle of classification. Its schedule prescribes rates for running large engines different from those for smaller, and lower prices for switching than for road work. Admission to its membership is conditioned virtually on having been a *poorer grade* of engineer for a certain period previously; so that the controversy is not as to the principle of classification, but rather on methods of application. The road doubtless believes that its neighbors have yielded a principle and that enginemen are now plenty enough to make it safe to stand its ground. The enginemen certainly made some unjustifiable claims, as, for instance, that all Brotherhood men should be passed free, and that no examinations as to intelligence, understanding of rules, color-blindness, etc., should be made unless they first agreed to them.

As we go to press the indications are that the road will conquer. Freight is not heavy, and most of that taken under the present low rates is carried at a loss; so that with competing roads at nearly every important point, the road feels comparatively little anxiety about the stoppage of that traffic. Passengers for all important points can likewise be accommodated without much inconvenience, and the local business is already provided for by sufficiently frequent trains to at least preclude any liability to serious distress. There is, of course, considerable risk in running trains with so many new men, or even with master mechanics and others who have got a little rusty, perhaps, and there must be great anxiety at headquarters; but the road is favored with a large proportion of comparatively level tangents, and the accounts indicate that commendable caution is observed by all hands.

The dispute bids fair to be settled so promptly that the primary principles bearing on such movements, as they affect the public, seem likely to be not much thought of. A common carrier is, like a gas or water company, enough of a monopoly to make a strike of employés a very different thing from a similar proceeding in a cotton mill; and whatever may be the rights of employer or employed, it is taking a tremendous responsibility to stop traffic on 5,000 miles of important public highway on 17 hours' notice. In the case under consideration we cannot help thinking that the responsibility is on the men, and we deeply regret that a body of men like the Brotherhood should have taken a step so damaging to themselves and so costly to the parties to the fight and to the public.

THE PRACTICAL LESSONS OF THE STANDARD OIL CASE.

The decision of the Inter-state Commerce Commission in the Standard Oil cases involves a number of points which are of interest to traffic officials.

The chief subject of complaint against the railroads was the great difference between the charges for oil in tank cars and for the same oil in barrels, car-load lots. That this difference was very large was not denied; but it was claimed by the defendant railroads that they offered shippers two modes of transportation, between which they were free to choose; and that as long as they offered each method to all impartially, the relative rates by the two systems were not matters for the Commissioners to decide. Without admitting the second point, the Commission laid special stress on the inaccuracy of the first; and it is here that the chief interest of their decision centres.

Were the tank-car rates offered to all shippers, impartially and publicly, in the manner required by the Inter-state Commerce law? At first sight it seemed that they were. Each class of rates was regularly quoted in the tariff; nor does it appear that rebates or specially low rates were allowed the Standard Oil Co., except in certain cases where agents failed to do their duty.

But a slight examination was enough to show that things were not as they seemed. If a man wished to ship oil in tank cars he was told that he must furnish the cars himself. This was no direct violation of the principles of equality, but it was a violation of publicity. The published tariff said nothing about the fact that the railroad would not furnish such cars; nor did it tell what allowance, if any, would be made for their use, or what terms would be made for their return. All this, as the Commissioners observe, is an important element in determining the virtual amount of the rate. The companies were bound to make it public, or at least to indicate how exact information on the subject could be obtained. But they did not do so. They made an effort to withhold the information, and in so doing they afforded the surest proof of the dangers involved in not making rates public. The want of publicity, whatever its original motives, led to a real inequality of treatment, and one which justifies severe censure upon all the officials concerned.

We do not in this article propose to discuss the broader questions of public policy connected with the half-compulsory use of private cars and private terminal facilities. We shall confine our attention to certain details of management where the roads were clearly in the wrong. It appears that the complainant had great difficulty in getting information with regard to rates, to which he was certainly entitled, and that in some instances he could not get it at all; that in this particular matter of tank cars, where the tariff was clearly defective, the railroad officials refused to give specific information, leaving many essential points to be settled by that very system of special bargains which it was the object of the Inter-state Commerce law to prohibit; that all these points which were thus left open were habitually interpreted to the advantage of the Standard Oil Co.; that the only apparent motive for leaving them open was to reserve the power to put the com-

plainant at a disadvantage, especially since the railroads refused to give any guarantee, either specific or general, that they would not use their power in that way.

It would take too much space to cite detailed instances of the difficulties which were placed in the way of the complainant when he tried to get information with regard to through rates. Agents at one point referred him to those at another, and among them he found it hard to get any information at all. There can be no doubt that the evidence introduced on these points told strongly against the roads. Here was a man who was entitled to information of various kinds. It was the duty of the agents to give it. They had no right to withhold it merely because they disliked the man who asked for it, or suspected him of trying to make trouble.

This was their duty in general; it was especially so in cases where the rate-sheet was defective, and did not fully comply with the requirements of the law. Such was the case with regard to oil. "In the rate-sheets which are published by the defendant," to quote from the opinion of the Commission, "rates are named for the transportation of oil in barrels and oil in tanks. . . . None of the rate-sheets of the defendant which were put in evidence notified the shippers that the carrier was not prepared to furnish rolling stock for transporting the oil in either mode; a reasonable inference from the rate-sheet not otherwise explained, would be that it was. If, however, the owner should desire to send a consignment of oil in tanks, and should apply to have cars furnished him for the purpose, he would be told at once that the company did not supply tank cars to its customers. . . . If outside the rate sheets he learns that he must furnish the tank cars, he is still unapprised upon what terms this is to be done. But when he seeks this information he learns immediately that the matter is or may be the subject of private negotiation, and perhaps of different terms in different cases. Thus the evils at which the statute was aimed make their appearance immediately."

It is right here that the case is most damaging to the roads. Complainant was considering the question of building tank cars. To decide this, he required information on four matters. 1. Through rates to points for which no quotation was published. 2. Mileage allowance for the use of cars. 3. Charges on return of empty cars. 4. Weight charged—whether actual or nominal. On all of these points he repeatedly applied for distinct information. On none of them was it given in the accurate and explicit way which he had a right to demand. On some of them it was given incorrectly; on some it was not given at all.

On the first point the Louisville & Nashville seems to have been the worst offender. A long correspondence is given where complainant asks for detailed information with reference to through rates, or for the general assurance that they will prorate with the Cincinnati, Washington & Baltimore on an equitable basis. He was not given the information, and he was told that the prorating arrangements were none of his business. "Complainant did not succeed in obtaining rates. The denial of his right was plain, and stands unexcused. What reasons there may have been for it we do not know, but we find that they were not just and legal reasons. . . . It was undoubtedly the business of the complainant to ascertain if he could whether this company would prorate on an equitable basis with any other road over which he desired to ship his oil, and in that way obtain through rates."

On the second and third points there was a conspicuous absence of any settled rule. The general practice was favorable to the shippers, but Mr. Rice could get no explicit statements as to the treatment which he would receive if he built tank cars. "It is impossible to doubt from the correspondence that the officers [of the St. Louis, Iron Mountain & Southern] would have felt at liberty to make a charge to complainant for returning his cars if he had shipped over their lines. . . . It appears that the Newport News & Mississippi Valley had no rule or settled practice as to paying trackage for the use of tank cars, and considered itself at liberty to deal with that subject by special contract." The Illinois Central was hardly any better off. It had a rule, but no one seemed to know what it meant.

But it was on the fourth point, with reference to actual weight charged, that the matters were worst. At least four of the defendant roads, and probably a fifth, while taking tank cars irrespective of quantity, refused to admit the fact. The agents of the Newport News and Mississippi Valley, and apparently of the Illinois Central, made direct misstatements. The Louisville & Nashville and the Cincinnati, New Orleans & Texas Pacific, did pretty nearly the same thing in less explicit terms. The St. Louis, Iron Mountain & Southern practically refused to give information on the subject.

"The remarkable thing about this matter is that so many of the defendants should make the same mistake; a mistake, too, that it was antecedently so improbable any one of them would make. The Louisville & Nashville, the Cincinnati, New Orleans & Texas Pacific, the Newport News & Mississippi Valley, and the Illinois Central, are all found giving out the same erroneous information, and no one of them can tell why or how it happened to be done, much less how so many could contemporaneously, in dealing with the same subject, fall into so strange an error. It is to be noted, too, that it is not a subordinate agent or servant who makes the mistake in any instance, but it is the man at the head of the traffic department, and whose knowledge on the subject any inquirer would have a right to assume must be accurate. In no case is the error excused, and if it be conceded that there was no purpose to mislead, the case is not relieved of unpleasant features, for gross negligence, when it is damaging, may be equally culpable with wrongs of intent."

This case shows clearly the importance of publicity of rates. Here was a case where information required by law was not published. This produced uncertainty, and the uncertainty produced discrimination. The moment the railroads broke the letter of the law they went on to violate its spirit and its intent. What may have been at first a sin of omission soon grew to be an abuse of the worst kind, involving the railroad authorities from the lowest to the highest. The agents refused information which they were bound to give; the traffic department was ignorant of things which it was its business to know; the companies undertook to countenance actions which were indefensible.

We have refrained from comment on the case while it was pending, because we could not believe that the meagre newspaper reports of the case did justice to the actual condition of things. How well-managed railroads, like the Louisville & Nashville or the Illinois Central, can come before the public with such a case as they have here presented, is something which we do not understand. From the first flippant answer to the original complaint down to the last damaging exhibitions of ignorance on the part of the traffic department, the attitude of the railroads is most unfortunate. It shows a misunderstanding both of the law and of the forces which are behind it. We do not mean to say that the complaint was justified in every particular, or that the Commissioners were clearly right in everything which they have said, but that the railroad agents and railroad companies have chosen a position in which they are clearly wrong, and that the sooner they abandon it the better.

Railroad Legislation in Iowa.

As the season for making laws advances and the time for active railroad building draws near, it is interesting to observe the persistent energy with which some of the law makers are trying to discourage the railroad builders. This is now especially to be seen in Iowa. We have already spoken of the remarkable bill introduced in the Iowa House to undertake the regulation of passenger and freight rates. It is not only proposed to fix a maximum passenger rate of two cents per mile, but actually to fix the freight rates for specified distances. The proposition to make freight rates an issue in the state elections is one which, from the politicians' standpoint, has novel and extraordinary merits. But this is not all that is proposed. One bill that has been introduced is to increase the railroad commission to five members, and to make the commissioners *elective*. While other bills actually introduced would increase largely the powers of the commission, various boards of trade urge that the commissioners should be empowered to classify freight and change rates. A bill that has just passed the House embodies some of these ideas. Under it the railroad commissioners shall fix a schedule of maximum rates and classify freight, and it is further provided that these rates shall not exceed those which *may be established by law*. The House, it will be observed, does not relinquish the notion of makingt rates itself.

In other words, it is proposed to take away from the owners of the enormous railroad property of the state of Iowa the most delicate and difficult part of the management of that property, and to give it over to the control of men untrained, irresponsible to the owners, and whose first object and duty must be to please the greatest number of voters. It should be remarked that none of this legislation of confiscation is recommended by the Board of Railroad Commissioners of the state. Indeed, that Board has long been known as a judicious and temperate body, whose efforts to wisely adjust the relations of the railroads and the public have been uncommonly useful and successful.

In its last report this Board expressly calls attention to the fact that while the roads in Iowa have in the aggregate a profit available for dividends and surplus amounting to but 2.2 per cent. on their capital stock, there is pressing need of great and costly improvement in their physical condition. Improvements in permanent way are required by the faster and heavier traffic. More rolling stock is needed; and the Board earnestly recommends a great outlay for automatic couplers, air brakes and safe heating. In the remarks of Mr. E. T. Jeffrey, General Manager of the Illinois Central, lately made before the Senate and House Committees, he calls the attention of those committees to the same facts. He asserts that there is not one railroad in the state of Iowa which is in proper physical condition. His standard is no doubt high. In order to safely carry trains of the weight now run and at the speeds demanded by the public, a road must have ballasted track, heavy rails, iron or steel bridges and culverts of masonry or iron. Better and more equipment is also imperatively required. The people of Iowa have complained bitterly for months of a lack of freight cars. From the last report of the Commissioners it appears that of all the bridges and trestles in the state 97 per cent. were of wood or combination, and 73 per cent. of the culverts were timber. Of the highway crossings 93 per cent. were at grade.

Thus is suggested something of the outlay of money demanded to put the Iowa roads in condition to serve the public as it requires to be served, and to satisfy the specifications of the Commissioners. We have seen that their earnings last year gave a surplus available for betterments and dividends of but 2.2 per cent. on the capital stock, and it is safe to say that only the most prosperous companies charged to operating expenses enough betterments to maintain their track in its present condition. But while the aggregate surplus was so small, only 13 roads out of 31 had *any* surplus. The remaining 18 made a deficit. Whence then shall the railroad companies draw the money for the great expenditures recommended and required? Obviously they are not earning it now, and if so, they certainly cannot earn it if the grangers have their way. It is quite as obvious that no man will wish to lend them money if the politicians of the state are to confiscate principal and interest. The alternative is to enact laws compelling the capitalists to contribute from their hoards for the building and improvement of railroads. This would be the logical carrying out of the policy of confiscation.

But the effect upon railroads already built of the proposed laws is not the worst result for the people. The roads that now exist cannot get away, and for a certain time must work, however onerous may be the conditions. But new local lines are wanted even in Iowa, and it is for the people to consider whether or not the building of these shall be made impossible. Again we find a useful illustration in the remarks of Mr. Jeffery. He tells the Senate committee that during the last six or eight months he has sent to his directors surveys aggregating nearly 500 miles in the state of Iowa. The question now is whether or not those new lines shall be built. It is not a question of probable traffic nor of money. The traffic is to be had, and the credit of the company will secure the money at low interest whenever it is wanted. "The consideration to-day is, and has been for some little time past, whether or not it is a wise or prudent thing to risk money in the construction of lines within the borders of Iowa, where, by extreme legislation, it may be wiped out of existence. I am speaking now of the views I know to have been expressed by those who control a great many of the large financial plans that originate in or are carried out by the money circles of New York, and through them the great financial centres abroad. Is this state prepared to-day to put itself in a position, for the imaginary benefit that would be derived thereby, of driving railroad construction and the development that ensues therefrom from within the borders of the state?"

It is apparent that in Iowa there are still many men of enlightened and temperate judgment, who remember the lessons of the past and can see both sides of this vital subject, and can reason correctly upon it. There is hope, too, that these men will prevail in the legislation of this session so far as to prevent the terrible blow which the charlatans and their misguided followers would deal to the welfare and prosperity of the state; but the situation is nevertheless alarming.

The Effect of Brakes on Wheels.

Our correspondent, "A Brakeman," raises a very interesting and important question in his letter printed on another page of this issue. The well-known fact that car wheels break more frequently after running down a long grade than at any other point shows that the long continued action of the brake shoes has a very detrimental effect on the wheels. Our correspondent asks whether the wheel to which he refers was broken from overheating and undue expansion caused by the use of hand brakes, and whether the accident could have been averted had reliance been placed wholly on continuous brakes.

In regard to the second part of the query, it may be urged that on a 4 per cent. grade (211 ft. per mile) a unbraked train soon acquires a considerable velocity, and that unless the reservoirs are re-charged very promptly after the brakes are released, the train will soon acquire a dangerous speed for the sharp curves which usually accompany 4 per cent. grades. The use of hand brakes on a few cars permits the continuous brake to be released and held in reserve to be used whenever the train acquires undue velocity. The same object is attained by the use of pressure retaining valves. By this means a small amount of pressure, about 15 lbs. per sq. in., can be retained in the cylinders of certain cars, while the brake is fully released on other cars and all the reservoirs re-charged.

No very definite answer can be given to our correspondent's query, as the data are uncertain. If the hand brake was set so hard as to exert a considerable pressure on the brake shoes, it undoubtedly contributed to the fracture of the wheel. A brake full on for five miles is a very trying test, and would be liable to heat the tread to a dangerous extent. This appears to have been the case in this instance, judging from our correspondent's description. It is obvious that the great expansion of the tread caused by the heat tends to make the tread separate from the body of the wheel. In a solid wheel, this can only be effected by an actual fracture. In a tired wheel, the tire expands freely, and becomes loose on the body of the wheel. When the brakes are released, the tire cools again, and consequently contracts and becomes again fast on the body of wheel. There is, of course, a certain amount of danger in a loose tire, but with a good tire fastening, such tires rarely cause mischief, as they cannot leave the wheel.

The moral to be drawn from the class of accident referred to by our correspondent is that a continuous brake which applies a moderate and known pressure to each wheel in the train is safer than a hand brake which applies an unknown and possibly excessive pressure on a small number of wheels, which, after a few miles run, become overheated and are liable to break.

Other points are that under such circumstances a tired wheel is safer than a solid wheel, and that a large wheel is less liable to heat than a small wheel. Each portion of the tire is, of course, only heated whilst it is in contact with the brake shoe. During the rest of the revolution, it is being cooled by contact with the air. The shorter the brake shoe and the larger the diameter of the wheel the greater the proportion of the cooling to the heating period and the larger the mass of metal to be heated. Our correspondent does not state the diameter of the wheels on the coal cars.

Some Annual Reports.

Cincinnati, New Orleans & Texas Pacific.—This company reports for the year ending Dec. 31, 1887, and it is a pleasure to deal with a report so clear and well arranged as that of the Cincinnati, New Oreans & Texas Pacific. We are glad to see that they are not merely explicit in their statements, but also fairly successful in their results.

The following table shows the general income account of the company for the fiscal year ending Dec. 31, 1887, in comparison with 1886:

	1886.		1887.	
	P. c.	Amount.	Amount.	P. c.
Gross earnings:				
Passengers	21.74	$626,463	$740,617	21.93
Freight	73.92	2,130,765	2,493,010	73.81
Mail service	1.99	56,904	63,694	1.89
Express service	1.51	43 655	55,531	1.64
Miscellaneous sources	.84	24,385	24,670	.73
Total	100.00	$2,882,172	$3,377,552	100.00
Operating expenses:				
Conducting transportion	22.04	$635,294	$694 730	20.57
Motive power	15.76	454,018	498,838	14.77
Maintenance of cars	5.22	150,455	209,830	6 21
Maintenance of way	11.82	340,720	452,467	13 40
General expenses	6.02	173 393	178,648	5.29
Total	60.86	$1,753,879	$2,034,573	60.24
Net earnings	39.14	$1,128,292	$1,342 979	39.76
Fixed and other payments chargeable against revenue:				
Taxes	2.76	$79 700	$82,214	2.43
Rental	28 94	834,043	912,000	27.01
Total	31.70	$913,743	$994,214	29.44
Surplus revenue	7.44	$214,549	$348,766	10.32

The change is the more gratifying because the road has for five years previous remained nearly stationary. The increase in freight earnings is due to an actual and decided increase in the volume of traffic, from 1,170,000 to 1,421,000 tons, or from 210,000,000 to 247,000,000 ton-miles. The average freight rate is the same as in 1886, and a little lower than in previous years. The increase in passenger receipts, on the other hand, is mainly, though not wholly, due to an increase in rates.

The additional traffic seems to have been handled with great economy. There was a reduction in passenger train mileage, while the increase in freight train mileage, from 1,085,000 to 1,198,000, is much less than the increase of the amount of freight carried. It is quite noticeable how slight has been the increase in expenses for transportation and motive power—hardly 10 per cent. in either case—in the place of a decidedly greater increase in volume of traffic handled. The increased operating expenses have chiefly been in the maintenance items, which is always a good sign. Even if we deduct from the year's surplus of $348,000 the expenditures on capital account (which ought to be thus deducted, as they will finally revert to the city), there remains a surplus of nearly $200,000; or deducting the sinking fund allowance, of $128,000 on the operations for the year.

A good deal of work remains to be done on the Cincinnati Southern under the terms of the lease. There are 7,530 ft. of wooden bridges and trestles that must be replaced by iron or masonry or by embankments, and there remains out of the total 26,356 ft. of tunnels 403 ft. that must be lined. The Ludlow shops must also be rebuilt, and additional locomotives and cars will be required during this year.

Chicago & Alton.—An abstract of the annual report of this company for 1887 will be found in another column, and it will be seen that it has shared fully in the prosperity of the year. In nearly all of the figures of operating results there is an increase. The gross earnings are the largest in its history, and so are the operating expenses, the passenger and ton miles and the tons carried. The net earnings are slightly less than in 1883, when the mileage operated was practically the same. The number of passengers carried was also greater in 1883 and 1884, but the increase in passenger mileage gives greater earnings from that source last year than in the years when more passengers were carried. The average passenger fare per mile was also greater than in 1884, but less than in 1883, having been 2.14 cents, 1.90 cents, and 2.06 cents in 1883, '4 and '7 respectively. In 1886 it was 2.02 cents. The rate per ton per mile was 0.946 cents, or less than ever before, but the increased ton-mileage gave larger gross earnings from this source than in 1885 and 1886, but less than in 1883 and 1884. While the freight tonnage increased as a whole 12.9 per cent. over 1886, the increase in local freight was 13.6, and in through freight 10.9 per cent. The average haul was greater also than in 1886 or 1888. The local freight was 74.8 per cent. of the whole. The passenger traffic shows less increase than the freight, and in this the through business has increased more rapidly than the local. The increase in passenger mileage was 5.0 per cent., and in mileage of local passengers 3.2 per cent. The local passengers were 91.6 per cent. of the whole. The average passenger journey has increased both for local and through, and the average number of passengers carried per train mile has increased 3.7 per cent. to 68.83.

The customary 8 per cent. dividend was paid, and the surplus was over $3,000,000. The operating expenses increased $619,000, of which $262,000 was in maintenance of way, and $181,500 in maintenance of cars. About 115 miles were ballasted, 89 with stone and the rest with cinder, at a cost of $172,000. The cost of stone ballast was $1,958, and of cinders $1,000 per mile. Five thousand two hundred and twenty-two tons of new steel rail was laid. These betterments and renewals were paid for out of earnings, and charged to operating expenses. The new cars appear as an increase in property.

Chicago, Burlington & Quincy.—The advance sheets of the annual report of the Chicago, Burlington & Quincy show that the gross earnings of the company, including all leased roads and branches, have been:

From freight	$12 675,655.04	
From passengers	6,629,859.06	
From mail, express and miscellaneous	2,270 564,12	
		$27,576,078.22
The operating expenses, including taxes, have been		16,097.913.04
Leaving net earnings from operating		$11,478,165 18
Add interest and exchange and other income		859.054 67
		$12,337,219.85
From this have been paid:		
Rentals	$198,168.04	
Interest	4,587,762.08	
Dividends	6,111.064.00	
Sinking funds	500.154.44	
		$11,397.148.56
Leaving		$940,071.29

The earnings from freight, as might be expected, have diminished about $700,000. This is more than offset by an increase of $1,000,000 in passenger earnings, and of over $500,000 in miscellaneous earnings, so that the total is some $800,000 greater than last year. Unfortunately the operating expenses have increased by twice this amount, so that the net available revenue is $800,000 less than last year in the face of slightly increased interest charges. The surplus of $940,000 actually available is $60,000 less than was carried to the renewal fund last year. Considering the unfortunate circumstances of the past year, both with regard to the crops and with regard to rate cutting, this result can hardly be called disappointing; but should a similar state of things continue for a year longer, it is doubtful whether it would be conservative policy to continue 8 per cent. dividends. We must defer more detailed comment till the appearance of the full report.

Buffalo, New York & Philadelphia.—The report of this company for the year ending Sept. 30, 1887, shows gross receipts of $2,806,000, against $2,624,000 for the previous year. But as $78,000 of the receipts for 1887 were due to the sale of assets, traffic receipts were only a little over $100,000 greater than the year before. Operating expenses had meanwhile increased from $2,049,000 in 1886 to $2,231,000 in 1887. The apparent balance was about $575,000 in each year; but in 1887 the actual current balance was only $497,000. The question of fixed charges is a somewhat complicated one, owing to readjustments which have been made during the past year.

The proportion of local to through tonnage has decidedly increased, but the extra cost of handling has more than counterbalanced the gain in average rates. The comparative statement for two years is as follows:

	—Cents per ton mile.—		—Per passenger mile.—	
	Receipts.	Expenses.	Receipts.	Expenses.
1886	0.49	0.40	2.91	2.19
1887	0.49	0.42	3.14	2.43

It is to be hoped that the new equipment which the company is to have will enable its traffic to be handled with better economy.

A Boston dispatch says a traffic agreement has been made between the Boston & Maine and the New York, New Haven & Hartford, whereby all freight to and from New York city which the former can control, will be sent via the Central Massachusetts and transferred to and from the New York, New Haven & Hartford at Northampton, Mass. The quantity of this traffic is uncertain, though holders of Central Massachusetts stock estimate it so high that they have succeeded in selling some stock at a considerable advance. Everything that can reach tide water by a competing line at Portland, Boston, Fall River, Providence, New London, etc., will have to be carried very cheaply and quickly to get it away from the boats, but there is probably enough non-competitive freight in the region indicated to add a nice percentage to the earnings of the Central Massachusetts and the New Haven & Northampton, if it is handled efficiently. The freight is mostly high class, and both these roads are now burdens on their owners. In the New York & New England's fight with the New York, New Haven & Hartford over freight for New York city, and concerning the Boston-New York passenger traffic, there is said to have been a truce declared. The New York & New England has abandoned its attempt to run freight boats from Norwalk to New York.

During the recent discussions on the breakage of wheels, the figures as to the number of wheel failures on the Pennsylvania have been referred to by different speakers. The correct figures were given by Mr. Crocker, Chairman of the Massachusetts Railroad Commissioners at the recent meeting of the New England Railroad Club. The percentage of broken and cracked wheels is $\frac{4}{10}$ of 1 per cent., or 1 in 250. This compares favorably with the results obtained on another large trunk line, where 1 in 158 of the wheels of the best makers failed during the year and as many as 1 in 12 of the wheels of the poorest makers were either cracked or broken. This enormous difference speaks for itself and shows very forcibly the absolute necessity for rejecting bad and cheap wheels made of poor iron. Price alone can never be a sufficient criterion in buying wheels, and if the damage and loss of time caused by broken wheels could be fully ascertained it would probably be found that the cheapest wheels were really the dearest in the long run.

In the Minneapolis switching case, of which mention was made in our last issue, Judge Young filed his decision Feb 28, ruling adversely to the Railroad Commission of Minnesota. It will be remembered that the Commission issued an order fixing one dollar as the maximum switching charge in Minneapolis, and that the Minneapolis & St. Louis appealed from this order. The Court holds that the functions of the Commission in respect to unequal and unreasonable charges are at first advisory and that it is not authorized to make arbitrary orders changing and fixing rates. The Commission may recommend, but not order changes, which upon certain statutory conditions become invested with legal force. The order appealed from is in no sense a recommendation, but in terms an order, arbitrarily directing and determining maximum charges, and it must be rescinded. It is thought that the Commissioners will appeal to the Supreme Court.

Mr. P. Hofecker, for many years master mechanic at Weatherly, on the Lehigh Valley, has recently joined the Central of New Jersey, and is fitting his improved valve gear on a passenger locomotive on the latter road. The engine will be subjected to some careful tests to ascertain the merits and economy of the new valve gear.

Seventh Meeting of the National Electric Light Association.

The seventh meeting of the National Electric Light Association was held Feb. 21, 22 and 23, at the Monongahela House, Pittsburgh, and was well attended, the number of delegates and visitors reaching over 200.

The business of the meeting was generally of a very interesting nature. The retiring president, Mr. J. F. Morrison, estimated the number of electric lights now installed in America or under contract as 175,000 arc and 1,750,000 in-

candescent operated from no fewer than 3,000 isolated plants and 1,000 central stations. He also pointed out that the accidents in connection with electric lighting were fewer and less chargeable to the danger of the system than in any similar industry that involves the use of power driven machinery. Mr. Morrison's successor is Mr. S. A. Duncan, of Pittsburgh.

A question which has lately occupied the attention of railroad men was brought up by Dr. Lange, in a paper dealing with the injury done to watches by magnetic influences. Dr. Lange described with approval some of the devices for protection now in use, and remarked that alternating currents, now coming into vogue, were less likely than others to affect watches, and were able to work their own cure. A discussion arose as to the effect of direct currents on ships' compasses, but the opinion was expressed that as the negative and positive wires ran together and as the compasses were generally shielded, little fear was to be entertained on this score.

This paper, as well as those of Mr. T. C. Smith and Mr. O. B. Shallenberger, of Pittsburgh, brought up, in fact, the most engrossing topic before the convention—that of alternating versus direct currents for lighting, etc. In arc lighting a high potential direct current is used, *i. e.*, one flowing continuously in the same direction; and the same kind of current, at low potential, as in the Edison system, has hitherto been used almost exclusively for incandescent lighting. The new departure in this country has been made on the initiative of Mr. George Westinghouse, Jr., and under his direction, and consists in the use of alternating currents for incandescent lighting. In this system the current delivered to the circuit is of alternate direction or polarity several thousand times a minute, and by means of a "converter" or induction coil at any point on the line is changed from high potential and small quantity to low potential and large quantity in the secondary circuit which carries the group of lamps. By this means far larger areas can be covered by lighting circuits with small conductors, and yet through its "conversion" the current is brought down to the safety limit for domestic and indoor use. Such a system naturally recommends itself for station or track lighting, and has already found such vogue and favor among electricians that within a year over 100,000 incandescent lights on the alternating system have been called for, and the present rate of growth is prodigious. Of course there is still room for much improvement in the system, and there is much to be said for and against it; and hence the importance of these papers, which placed the system before the convention in a very encouraging and optimistic manner, as regards the various points of economy, safety, handiness and flexibility.

Two or three valuable papers dealt with the mechanical or steam department of electric lighting. Mr. J. B. Edson made a very able address on steam pressure records, and Mr. C. A. Schieren dealt with the subject of belting, while Mr. W. Lee Church made out an extremely strong case for the use of a number of independent high-speed engines in an incandescent lighting plant as compared with one or two large long-stroke engines. He drew special attention to the immunity obtained with a number of engines from breakdown, and the great economy secured by working each of the high-speed engines to their full capacity, as the load of the station rises from notch to notch and requires another dynamo to be put in operation.

Owing to the prominence given to methods of current distribution above referred to, electric motors did not come in for their usual share of attention. Only one paper, that of Dr. G. N. Liebig, of a theoretical character dealt with the topic, but the reports made were sufficient to show that there were very few companies of any size which had not put in motors or were preparing to do so. Several new uses of the motors were mentioned, one being the hauling up of tobogans on the slides at Minneapolis.

Most of the delegates went out to see the Bentley-Knight electric railroad in Allegheny City, where the steep heights of Observation Hill, with grades of 10 per cent., are climbed on sharp curves by cars equipped with twin Thomson motors and carrying 50 or 60 passengers. Already more than two miles of the road are in operation, and the total length will be over four miles. Two cars are now running and others are being put together in the car sheds on the road.

The system is part underground conductors in a conduit, as in a cable road, and partly overhead with trolly contact. The conduit is the same as that which is to be used on Fulton street, New York, and really works to admiration, giving practically, as far as one could judge, less trouble than the overhead section. The fuel used under the boilers is natural gas, at a cost of $1.60 per day, or only 80 cents for each of the cars in operation, and less as each new car goes into service.

In Pittsburgh, a Daft road with grades of 16 per cent. has been built, but it is not yet ready for use. One feature of it is the use on the grades of a perforated metal band, with which a sprocket wheel engages, under the car. On the Allegheny city road, part of the grade has a stretch of rack rail used with one wheel of the car.

An important subject, that of underground wires, received much discussion. It came up on the receipt of an able report from Prof. Elihu Thomson on the insulation of wires and the installation of plants, and was handled in papers by Mr. W. W. Leggett and Mr. J. M. Smith, both of Detroit. While the general tenor of talk was not particularly hopeful, it was felt that progress was being made toward a solution of the difficulties. Incandescent circuits, both direct and alternating, are now underground, but the trouble is with arc wires carrying potentials of 2,000 and 3,000 volts. The topic is of absorbing interest. All degrees of authorities, municipal and state, are ordering the wires out of sight, and the companies desire to observe the law and for their own sake avoid the danger, worry and attendance incident to overhead circuits, but the fact that to-day there is no underground arc circuit lighting that can be called an undeniable success indicates the gravity of the situation and the difficulty of the problem.

TECHNICAL.

Car Heating Notes.

A Delaware & Hudson train fitted with the Sewall Heater made a trial trip between Wilkesbarre, Pa., and Carbondale on Tuesday, and the temperature was maintained at between 68 and 70 degrees. Furtner tests will be made during the next two weeks.

A new method of continuous heating is undergoing test on the Pittsburgh, Fort Wayne & Chicago. Two lines of pipe are used, the steam being returned to the engine. The temperature is regulated and a uniform degree of heat maintained by an automatic regulator, so arranged that when the thermometer registers a higher temperature than is desired, the transoms are automatically opened and closed again as soon as the heat has been reduced to the degree that is wanted. It is claimed that after a car is once heated it can be cut off from the engine, and if side-tracked, as is frequently the case, it will remain comfortably heated for several hours.

Locomotive Building.

Twenty-five locomotives are now being built for the Atlantic & Pacific road, and will be ready to put into service within the next sixty days.

The Grand Rapids & Indiana has contracted with the Pittsburgh Locomotive Works for several new large locomotives.

The Cleveland & Canton has ordered 18 standard gauge engines.

The Louisville & Nashville has just received 10 new locomotives for the South Alabama division.

The Pittsburgh Locomotive Works, Pittsburgh, Pa., recently completed an order for two locomotives for the Mexican Central.

Bridge Notes.

The Commissioners of Tom Green County, Texas, have appropriated $15,000 for building an iron bridge over the Midde Concho River.

Olin Bryan, Centreville, Md., will receive bids for building a bridge across a fork of the Corsica River, until March 6.

Proposals for building a bridge across the Flint River will be received until March 20 by Joel Matthews, Thomaston, Ga.

The contract to build one-third of the iron bridges along the Nashville & Knoxville has been awarded to C. O. Shultz, of Pittsburgh, Pa.

Bids will be received for building an iron bridge over the Colorado River near Ballinger, Tex., by the commissioners of Runnels County.

The Milwaukee Bridge & Iron Co., of Council Bluffs, Iowa, have nearly completed the trestle work for a new bridge at Council Bluffs.

The Fairfield Paper Co. is to build a bridge of two spans across the Westfield River, near Westfield, Mass.

An iron bridge on a freight branch of the Central Massachusetts road in Gilbertville, Mass., had to be blown up with dynamite last week to prevent damage to surrounding property from an ice gorge.

Proposals are invited for a bridge over the Mispillon at Milford, Del. No date specified. Address John D. Morris, Georgetown, Pa

The county commissioners, Ashtabula, O., will receive bids for erecting a bridge.

The South Carolina is putting in iron bridges along the line of its road. Details can be had by applying to J. W. Craig, Roadmaster, Charleston, W. Va.

A bridge will be built over the Maurice River, near Mauricetown, N. J., at a cost of $50,000, by the Cumberland County Freeholders.

It is said that the Pennsylvania will replace 90 wooden bridges on the Uniontown branch with iron structures.

The Bridge Committee has prepared a bill authorizing the Union Pacific Ry. Co. to build a bridge at 9th street and Cumberland avenue, Philadelphia. The cost will be about $85,000.

A bridge is projected to be built across the Ohio River at Steubenville, O., at an estimated cost of $120,000, of which the city is assessed to subscribe $40,000.

The new bridge over the Schuylkill, in Philadelphia, will be opened to the public in a few days. Work was commenced on it in September, 1886, and thus far it has cost $280,000.

Manufacturing and Business.

The Birmingham Equipment Co. has been incorporated in Kansas; capital stock, $1,000,000; incorporators, George H. Nettleton, Wallace Pratt and J. S. Ford, of Kansas City, Mo.; E. V. R. Thayer, of Boston, Mass.; C. W. Blair, of Leavenworth; B. P. McDonald, of Fort Scott; and O. E. Learnard, of Lawrence; object, to manufacture or purchase engines, cars, rolling stock and other equipments for railroads, and sell, hire or lease them to companies.

The Thomson-Houston system will be used in lighting the station of the Baltimore & Ohio at Grafton, W. Va.

The Ehret-Warren Manufacturing Co. has been incorporated in St. Louis, Mo., with a paid up capital of $150,000, and will manufacture prepared roofing. They have purchased the entire interest of M. Ehret, Jr., & Co., St. Louis, and S. D. Warren & Co., St. Louis and Kansas City.

Owing to the continued high prices of copper and tin, the Phosphor Bronze Smelting Co, Philadelphia, has withdrawn all prices and discounts heretofore quoted on phosphor bronze manufactured goods.

It is stated that the Corey Car Works, of Chicago, Ill., contemplate removing their shops to Arkansas. George R. Brown, Little Rock, Ark., is connected with the company.

The New York Iron Roofing & Corrugating Co. have taken the agency for a large sheet-iron mill in Pennsylvania, and will carry in stock a full line of their products. They also report a very large sale of their corrugated roofing to one of the railroads of Central America.

The Scarritt Furniture Co., of St. Louis, has added the "Improved Forney" to its already large line of car seats, having accepted the general agency of the same. Recognizing the possibilities of the "Forney" the company has prepared to manufacture it in large quantities. Mr. S. G. Scarritt, who has charge of the railroad department, informs us that the demand for this seat is increasing. The travelers and railroad men, who have seen the two cars recently fitted up by the Michigan Central Railroad, approve of them. They have received orders from the Wabash, Louisville Air Line, Lake Erie & Western and others.

A New Tracklaying Machine.

A tracklaying machine, the invention of Messrs. D. L. Moore and Alexander Rice, of Chicago, has been used with favorable results on the Louisville Southern. It is claimed that the capacity of the machine is from two to two and a half miles a day, and that it not only lays the ties at regular distances, but places the rails in their correct position, ready to be fastened by the force of hands which follows.

Magnetic Influence of Iron and Steel in Locomotives on the Watches of Engine Runners.

The American Railway Master Mechanics' Association issues the following circular, dated Feb. 25:

1. Have you noticed any variation in the running of your watch on or off your engine?
2. Have you noticed any variation in the running of your watch when in your regular daily employment, and when off one or more days?
3. Have you noticed any difference in the rate of your watch between summer and winter months?
4. Does the main spring of your watch break frequently?
5. How many times have you had a new main spring in your watch?
6. At what season of the year does the main spring break most frequently?
7. Have you noticed any coincidence of storms and breaking of main springs?
8. Have you noticed that the main spring would be broken after a thunderstorm, or an electric disturbance of the atmosphere?
9. Do you compare your watch with the standard time daily?
10. Do you note the variation of the watch with the standard time, absolutely, down to a second?
11. Do you set your watch when it is a little "off" time, or do you carry the variation in your mind?
12. Have you ever noticed any difference between the average running of watches carried by engineers and conductors?

NOTE.—Answers should not be confined to the above questions, but should include any information or suggestions that would be valuable to the Committee.

JAMES MEEHAN,
HARVEY MIDDLETON,
T. W. GENTRY,
} Committee.

Replies to be addressed to James Meehan, Cincinnati, New Orleans & Texas Pacific Ry., Ludlow, Ky.

The Simonds Rolling Machine.

A new process of rolling irregular forms has been devised by Mr. Geo. F. Simonds, of Fitchburg, Mass.

It may be briefly described as a machine in which two flat surfaces, acting vertically or horizontally, and moving in opposite directions, with adjustable dies fixed upon them, roll in one motion a piece of metal of regular or irregular shape, and in almost any pattern desired. Among the articles made are wagon axles, spindles, wrist pins, monkey-wrench screws, 2 in. steel balls, chair screws, taper pins, boot calks, horse-shoe calks, cap screws, scale spindles, harness staples, 40-calibre projectiles and small balls. Fourteen rolling machines are in actual operation at the inventor's works at Fitchburg, and it is claimed that car axles can be rolled to form in a machine of this description instead of being made under a steam hammer.

It is claimed that a perfect screw thread can be formed by compression without any waste of metal.

The American Institute of Mining Engineers visited Fitchburg recently and saw the machines in operation, and it is stated that the members were much pleased with the results. A stock company will shortly be organized to develop the invention on a large scale.

Safety Appliances for Shops and Mills.

We have received a circular issued by the Committee of Associated Factory Mutual Insurance Companies, which sets forth instructions for watchmen, overseers, etc., in factories, and indicates certain appliances suitable for use. The committee states that it has not interposed any objections to the use of petroleum for fuel whenever it can be kept in closed tanks, safely placed in regard to surrounding buildings, and a pipe from the tank to the boiler room so arranged that it will form a siphon, preventing flooding in case of accident. The committee also recommends dampers in dust flues, and does not recommend or consent to the use of non-freezing compounds for the automatic sprinkling apparatus. For fire pails, the indurated fibre pail invented by Mr. Conant and made by the Union Indurated Fibre Co., 110 Chambers street, New York, is especially recommended as being strong and proof against corrosion. The new form with a hemispherical bottom, to prevent its use for other than fire purposes, is recommended. These pails are now made with chines at the bottom, for greater convenience in handling and also in setting them upon shelves. The rounded bottom projects below the chine.

A Powerful Molding Machine.

An unusually powerful wood-working machine has been lately constructed for the Mitchell Furniture Co. of Cincinnati, by the Egan Co. of the same city. It is stated that it will take a single plank of solid wood, 14 in. by 4 in., of ash, oak or maple, or any hard wood, reducing it in one cut to a single molding, cutting a depth of 3 in. with the main head, and 2½ in. with the lower and each side head. Such a feat has up to this time been considered impossible.

The Nicaragua Canal.

The bill to charter this enterprise, the "Maritime Canal Company," has passed the United States Senate. The surveying expedition is prospering and it is expected that the bonds of the company will, before long, be authorized and put upon the market. It is said that about $65,000,000 will be issued.

A New Refrigerator Car.

A new refrigerator car, which is operated on an entirely different principle from that usually employed in refrigeration has recently made a first trip between Chicago and Florida laden with beef from Armour & Co., of Chicago.

The car is the Palmer Mechanical Refrigerator Car, and is of the usual size. The peculiar feature of the car is that ice is not required to keep it cool, but this is done by means of machinery which is placed in and occupies about four feet of one end of the car. This machinery is run by means of a belt which passes up from one of the axles of the car and is regulated in speed by two cone shaped pulleys.

Instead of ammonia, chloride of ethyl is used for refrigerating purposes. This passes through a mass of pipes at the end of the car, having the same effect on the air in the car as the ammonia has on water in ice factories. This fluid boils at a temperature of 52 degrees, and it is claimed that it is much more economical than ammonia, as at 24 lbs. pressure per sq. in., 4 lbs. of it is equal to 200 lbs. of ammonia. The fluid, in being forced through the pipes, is changed to gas, which passes back into a condenser, where it is again converted into fluid, and by means of the pump is forced back through the pipes, and so on indefinitely, 100 lbs. being all that it is required to refrigerate the car for several years. By means of the cone pulleys and a coal oil stove the temperature in the car can be kept at any degree from 26 to 70 degrees, and besides there is at the top of the car a fan, which is also operated by the machinery attached to the axle, which keeps a constant current of fresh air through the car at all times.

This car is particularly useful where ice cannot be obtained, and is also adapted for the transportation of fruit. It stated that the meat in the car was found to be as sweet and as pure as when first killed, and as dry as could be desired, notwithstanding it had been out a week. The car will be

sent back to Chicago from Florida full of fruit, and if found successful for the service several hundred will be built during the summer and the company will establish a branch office in Florida for the handling of the fruit. Each car is accompanied by an attendant whose duty it is to push it through to destination as rapidly as possible. The car is supplied with air brakes, and can be placed on any passenger train.

A Ten-wheel Locomotive on the New York Central.

The new ten-wheel locomotive just built for the New York Central at the Schenectady Locomotive Works, made a trial trip recently over the Schenectady & Troy Division. It hauled a train of 25 loaded freight cars, and made the trip from Schenectady to Green Island, 20 miles, in 1 hour and 5 minutes.

The Rival Vestibule Trains.

The answer of the Wagner Palace Car Co. and the Lake Shore & Michigan Southern to the bill of the Pullman's Palace Car Co. seeking an injunction to restrain the infringement of the famous vestibule train patent issued to H. H. Sessions, Nov. 15, 1887, has been filed. The answer denies that Sessions was the first and original inventor of the invention patented by him, and sets up sixteen English patents dated from the year 1836 to 1865, also eighteen United States patents, which, it is claimed, contained the material parts of the Sessions invention. Further, that the invention had been known and used long before by the Michigan Central, Chicago, Burlington & Quincy and the Lake Shore & Michigan Southern, and was also described in a publication "Miller's Platforms for Railroad Cars," by Ezra Miller, published in New York, in 1873.

It is further denied that the application for the Sessions patent was subjected to an unusually critical and exhaustive investigation in the Patent Office as to novelty, but, on the contrary, many of the above English patents were not brought to the attention of the examiner, among them the patents of Henry Bessemer, M. A. Garvey and C. S. Smith; but even then the Sessions application was repeatedly rejected, mainly on the patent of Rock Chidley, of England, issued Jan. 11, 1865. Also, that the thing patented by Sessions is wholly useless for the purposes declared, and that the description contained in the patent is insufficient, as it does not state the strength of the elevated buffer-springs, but leaves it to be wholly found out by experiments. Neither is the invention of great utility or value, though it is admitted that the first Pullman vestibule train was a startling novelty and was visited by crowds of people, and that many believed that the Pullmans had a monopoly in it, but it is denied that it is a novelty. It is also denied that the Sessions patent buffer accomplishes great things in the direction of comfort and safety, and the collision tests at recent accidents are said to be no tests at all.

They explain their application to the Pullman Company for a license by saying that they had been informed that the Pullman Company had a large number of applications pending in the Patent Office for various improvements in vestibule cars, and in order to avoid controversy applied to the Pullman Company for a license to use such patents for a nominal consideration. They did not mean, however, by this in any way to admit the validity of any of the patents, but only desired to avoid annoying and expensive litigation.

In conclusion the defendants admit that they constructed cars bearing a close resemblance externally to those of the Pullman Company, and provided with frame plates forced out by springs, so as to be in frictional contact. Also that they have a composite vestibule train in use. But they deny that the frame plates were intended to operate, as described and claimed by Sessions, as buffers to prevent end-shocks and oscillations; or that they have any such operation, or that they are infringements, or that the defendants have enjoyed great benefits, profits, and advantages from the unlawful use of Sessions' brain product or in fact that there has been any unlawful use of it.

Electric Train Lighting in Russia.

The plant used upon some Russian trains lighted by electricity includes a Crompton compound dynamo machine. At present the light is used only on certain express trains, and in tunnels between Kieff and Odessa. There are three circuits of 2,000, 1,460 and 6,540 ft. respectively. The rails are used for the return conductor, and the other wires are laid in a central tunnel between the tracks. Contact is made in each tunnel with the wire for that circuit by contact pulleys on the car axles. Each car has its own contact with the wire, so that all complicated connections of coupling a train are avoided. The train may stop while in the tunnel and the system will continue to operate. The company has applied the system to 74 cars, and they report that the expense of the system is less than one-third the cost of gas.

Canda Cattle Car Company.

This company has been organized with the following board of directors: R. T. Hunter, W. H. Barnum, W. P. Robinson, Henry Wolcott, C. J. Canda, A. Marcus, F. E. Canda, A. W. Soper, B. N. Harrison, J. W. Savin and Alphonse Kloh. The company will sell or lease their stock cars, or furnish them to be run on a mileage basis, or sell the right to use to any company preferring to build or remodel its own cars. W. P. Robinson is Vice-President and General Manager; A. Marcus, Treasurer; J. W. Savin, Secretary, and Alphonse Kloh, Assistant Secretary. The offices are at 52 Exchange Place, New York.

THE SCRAP HEAP.

Places for Technical Graduates.

Prof. Thurston, of Sibley College, Cornell University, has issued a circular to a number of prominent manufacturing firms, calling attention to the fact that a considerable body of highly instructed young men is annually turned out from that institution, and suggests that they might with great advantage find places in various technical establishments. He also wishes to know whether it would not be possible to adopt a plan, long in operation in foreign countries, by which large establishments take each year a specified number of young men and give them opportunities to learn the business, and asks that the recipients of the circular give him information of the number of these young men whom they will take, with compensation, and other particulars.

Manitoba.

Mr. Joseph Martin has announced that at the coming session of the Federal Parliament the Legislature of Manitoba will ask for an act authorizing the building of iron railroad bridges over the Assiniboine River at Portage la Prairie and at Winnipeg. These bridges are part of the new railroad projects of the Manitobian government.

From St. Paul to Pekin.

Everybody knows the wonderful enterprise and energy of St. Paul. One of the recent great ideas emanating from that city is that of establishing railroad communication with Pekin. The distance is said to be only 5,169 miles, and it is satisfactory to have exact figures. The project is simply to connect St. Paul with the Canadian Pacific, to run a line of railroad from the western terminus of the Canadian Pacific up the Pacific coast, to cross, for the present by ferry, Behring Straits, and thence by rail to Pekin. It is suggested that the Behring Straits will present no serious obstacle to a ferry, but that eventually they will be bridged. There is abundant timber along the route, a mild and equable climate, and, of course, the traffic which will be secured will be enormous. We do not learn that Minneapolis is to be taken into the enterprise.

The Steel Beams of the Cruiser "Charleston."

The Secretary of the Navy has received a report on the beams which broke some time since which says: "The failures of these four beams was certainly an unusual occurrence, and at the present time unaccountable, as the material had stood all the regulation tests previous to its receipt in the building yard." It is further said, from the behavior of other beams it appears the material is of excellent quality. The report closes with the recommendation that all beams so leoated as to be strained by the discharge of heavy guns should be annealed before being placed in the ship.

"Enterprise."

A St. Paul dispatch gives the following instance of passengermen's tactics. It will not be many years before some of these bright young men will write G. P. A. after their names:

"Much ill-feeling has been stirred up among the passenger men by a deal at Minneapolis by the Burlington & Northern. From 40 to 50 glassworkers wanted to go to Pittsburgh and Ravenna, O., and of course all the passenger agents were after them. It seems that the same people had traveled over the Wisconsin Central before, and the agent of that line got an agreement from the committee in charge of the party to go by his line. He ordered a coach up from Milwaukee for the party, but the Burlington laughed last and secured the game. Although after the party had been visited by the Burlington agent the Wisconsin Central representative again saw the committee and offered a fifteen-dollar rate he could not get the business. The regular rate is $17.45, and it is claimed that the Burlington took the men for $15.45 each, making the deal in such a way that full price was paid for the tickets, but enough money was refunded to return $2 to each man, while the three members of the committee went without cost.

Profit Sharing.

H. K. Porter & Co., Pittsburgh, Pa., manufacturers of light locomotives, made their second annual profit sharing distribution with their employés last week; the amount being estimated according to the salary of the employé. Some of the men received as high as $120, and the foremen's and overseers' shares ranged from $150 to $300.

What Have They Been Giving Him?

Madison Square is filled four days in the week now with tramps sunning themselves on the benches. They take a fine æsthetic delight, too, in watching the park employés turn the cranks which store away power for the electric arcs at the top of the big pole.—*N. Y. Tribune.*

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In Massachusetts, the Supreme Judicial Court decides that the power to take land in the state by eminent domain may be given by the legislature to a foreign corporation; that while the latter cannot transfer such power without the consent of the legislature to another party; yet the legislature may ratify a transfer illegally made.[1]

In Massachusetts a man was indicted under a statute punishin one who should "wilfully throw or shoot a missile" at a car. The indictment charged him with throwing a stone at a car. The witnesses, at the trial, swore that they saw the man throw at a car a triangular piece of wood about 10 in. long on one side, about 7 in. long on the other two sides, and about 1½ in. thick. There was no evidence tending to show that a stone or anything else, except as above stated, was thrown. The man was convicted. The Supreme Judicial Court reverses the conviction, on the ground that a piece of wood is not a "stone" and hardly a "missile" either.[2]

In Minnesota the Supreme Court rules that where in condemnation proceedings by a railroad a village lot is appropriated under the description thereof as designated by a survey and plat of the same, the company takes presumptively to the centre of the street. And, subject to the public easement and the control of the proper public authorities, the company acquires the same interest in that portion of the lot so taken lying in the street as to the remainder thereof, and may apply it to the same uses.[3]

In Kansas, the Supreme Court decides that a settler on the public lands of the United States who makes a valid homestead entry, and continues to reside on and improve the land entered, in compliance with the land laws, has the exclusive right to its possession and use, and to the improvements made thereon, and he also acquires equities in the land itself which increase from the time the entry is made until the complete title is earned. Such a settler may sell and transfer a portion of his homestead for a right of way for a railroad, or his interest therein may be condemned and appropriated for such purpose upon adversary proceedings, and by paying full compensation to the settler therefor. A railroad company which enters upon a homestead, and constructs a road thereon without his consent and without making just compensation, is liable for the injury thereby done to his interest, the extent of which injury is for the jury to determine.[4]

Injuries to Passengers, Employes and Strangers.

In Virginia a female passenger stepping over a train at night went out of the waiting-room and walked to the end of the platform where she fell off and was injured. The night was dark, and the lamp at the end of the platform had been temporarily removed. The Supreme Court of Appeals rules that she cannot recover damages. She was negligent, in walking, without cause or need, in the dark.[5]

In North Carolina a passenger on a freight train, while standing up in the caboose, was thrown down, owing to a sudden movement of the train, and a bone of his thigh was fractured. The evidence showed that the plaintiff knew of the jerks incident to freight trains; that there was a seat at his disposal; that there had been frequent jerks during the journey, such as are usual in freight trains, and other passengers had kept their seats in consequence. The Supreme Court holds that the plaintiff was guilty of contributory negligence in standing up.[6]

In Minnesota one of the risks which an employé runs as to injuries by "snow ploughs" is judicially stated. One of a gang of section men was killed by a snow plow while engaged with others with a hand car on the track. They were engaged in their ordinary work under the direction of the foreman, who was present with them, and who was also killed by the same accident. They had been shoveling snow, and were at the time returning to the section house with the car, in the midst of a severe storm of snow and wind, in consequence of which they did not hear or see the approach of the engine and snow plow in time to make their escape. The Supreme Court holds the railroad not liable, saying: "The evidence in the case shows that regular trains run according to schedule time, and that wild, special or extra trains run at any time, and that an engine or snow plow is a train of this class, of whose approach no notice is given under the rules and practice of the company. Now, if the deceased and his fellow section men knew, or from their observation and information about the running of the trains ought, in the exercise of ordinary intelligence and prudence, to have known, that an extra or wild train might come over the road at any moment, without notice, they must be deemed to have assumed this as one of the hazards incident to the employment. There does not seem to be any reason why at that season, and in such a storm, a snow plow might not with as much reason be expected as any other extra train. The employés of the company are presumed to understand the nature, use and operation of snow plows, and that they are liable to be run frequently over the road in the proper season, as well during storms as at other times, and if any extra risk attends their use it must be met by corresponding care and caution on the part of the men."[7]

In Kansas the Supreme Court rules that where, in the discharge of a dangerous duty, a railroad employé voluntarily places himself in a dangerous position unnecessarily, when there is another place that is safer that he could have chosen, and he has time to exercise his judgment, and injury occurs to him by reason of his choice, he cannot recover for such injury. Applying this principle to the facts of the particular case before them, the Supreme Court held that if the rear right-hand step on the cab of a switch engine is defective, and a person employed by the railroad company is discharging the duties of a helper to a hostler in charge of the engine, attempts to get upon such step when the engine is in motion, and when the step is partially obscured by escaping steam and dust blown up thereby; when he had no duty to perform that required him to get on at such a place, and when the rear foot board was a safer place to get upon the engine in motion; when he deliberately chose to get upon the side step without any directions so to do; when he had adopted the plan of getting on and riding on the side; when he was afraid to attempt to get upon the front foot-board because the engine was going too fast, and in his attempt to get upon the side step his foot slipped off, rested on the rail and one of the wheels of the engine so mashed and mangled it as to compel amputation, he cannot recover for such injury on account of the defective condition of the step.[8]

In New York the Court of Appeals decides that movable stakes, inserted in permanent iron sockets on the sides of a railroad platform lumber car, serving as sides of the car, are appliances which it is the duty of the railroad company, as master, to fit or prepare to the use for which they are designed, and the company's duty towards its employés in this respect cannot be avoided by furnishing the car to a shipper without the stakes and leaving it to him to insert them. A defect in one of such stakes is a defect in the car as a "lumber car." Nor can the road escape liability for an injury to an employé caused by the breaking of one of these stakes on the ground that the defect was not visible on the previous inspection of the car.[9]

In New York, a brakeman went in the night time with a co-employé, a car coupler, to attend to attaching an "ash car," standing by itself on the track, to a locomotive which they had just come from, which was to be backed down to the car by the engineer. The coupler went to the end of the car towards which the engine would come, without his lantern, having left it on the rear of the engine; plaintiff went to the other end of the car to get upon it to attend to the brake when the car should be coupled to the engine. The car had no step and plaintiff was obliged to take hold of the brake rod and put his foot on one of the bumpers. While so doing, the engine, moving at the rate of 8 to 10 miles an hour, struck the car with such force that the car was set in motion and the plaintiff was thrown down, pushed along by the brake beam about 200 feet and then run over by the car wheels and injured. Evidence was given by the plaintiff, tending to show that the car brake was defective, and that if the brake had been in proper condition and set the car would not have moved more than 5 or 10 ft. from the effect of the collision with the engine. The plaintiff, in an action for damages, was non-suited at the trial. The Court of Appeals holds that this was wrong and reverses the judgment which the company had obtained in its favor.[10]

In Massachusetts a milkman, in the early morning, it being hardly light, finding the gates at a railroad crossing open drove on. He had got half way across before there was any warning and before the gates were shut, and the first warning he received was when the gates were shut and the gateman shouted, "Stop"—which he may have heard only as an alarming sound. He whipped his horse, the gateman shouting to him to come on and opening again the gate in front of him. He went on, but was struck before he got over and killed. The Supreme Judicial Court hold that he was not negligent and affirm a verdict against the company.[11]

In Michigan a boy of seven was injured at a crossing by a train. He testified on the trial, and the evidence of himself and others showed, that he had been playing with other boys about the track before the accident; he had shortly before crossed at the same place; and that, when struck, he was still playing, and running to overtake his comrades; that he did not look for a train, or hear any warning, or know of this one's approach, or that one was due; and that he was accustomed to play there, knew the danger, tried to get off the track before being struck, did not see the train, but could have seen it over 400 ft. away, and, if he had, would not have tried to cross. The Supreme Court rules that the boy was not negligent and that the railroad must pay damages.[12]

In Colorado a man partially deaf walking on a track did not hear the repeated whistling of the train coming behind him, and was struck and injured. The Supreme Court held that he was negligent, and cannot recover damages.[13]

[1] Abbott v. N. Y. & N. E. R. Co., 5 N. Eng. Rep., 17.
[2] Com. v. McCarthy, 5 N. Eng. Rep., 511.
[3] Witt v. St. P. & N. P. R. Co., 35 N. W. Rep., 862.
[4] Burlington, K. & S. W. R Co. v. Johnson, 16 Pac. Rep., 125.
[5] Reed v. Richmond & A. R.R. Co., 4 S. E. Rep., 587.
[6] Wallace v. Western N. C. R. R. Co., 4 S. E. Rep., 503.
[7] Leon v. St. P., M. & M. Ry. Co., 35 N. W. Rep., 866.
[8] Union Pac. Ry. Co. v. Estes, 16 Pac. Rep., 131.
[9] Bushley v. N. Y., L. E. & W. R. R. Co., 10 Cent. Rep., 238.
[10] Lilly v. N. Y. Cent. & H. R. R. Co., 10 Cent. Rep., 249.
[11] Doyle v. Boston & A. R. R. Co., 5 N. Eng. Rep., 454.
[12] Baker v. Flint & P. M. R. R. Co., 35 N. W. Rep., 836.
[13] Kennedy v. Denver, S. P. & P. R. Co., 16 Pac. Rep., 210.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atlanta & Charlotte Air Line, annual meeting, New York, March 14.

Chesapeake & Ohio, annual meeting, Richmond, Va., March 15.

Chicago, St. Louis & Pittsburgh, annual meeting, Indianapolis, Ind., March 21.

Cleveland, Columbus, Cincinnati & Indianapolis, annual meeting, Cleveland, O., March 7.

Illinois Central, annual meeting, Chicago, Ill., March 14.

Louisville, New Albany & Chicago, annual meeting, New York, March 14.

Missouri Pacific, annual meeting, St. Louis, Mo., March 13.
Nashville, Chattanooga & St. Louis, special meeting, March 21.
New Orleans & Northwestern, annual meeting, New Orleans, March 5.
New York, Rutland & Montreal, annual meeting, New York, March 8.
Pennsylvania, annual meeting, Philadephia, Pa., March 13.
Peoria, Decatur & Evansville, annual meeting, Peoria, Ill., March 6.
Rome, Watertown & Ogdensburg Terminal, special meeting, New York, March 12.
St. Joseph & Nebraska, annual meeting, St. Joseph, Mo., March 6.
St. Louis, Iron Mountain & Southern, annual meeting, St. Louis, Mo., March 13.
Texas & Pacific, annual meeting, New York, March 7.
Utah & Nevada, annual meeting, Salt Lake City, March 3.
Wabash Western, annual meeting, St. Louis, Mo., March 13.
Wheeling & Lake Erie, special meeting, Toledo, O., March 22.
Washington County, special meeting, New York, March 19.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *General Time Convention*, spring meeting, will be held in New York, April 11.
The *National Association of General Passenger and Ticket Agents* holds its annual meeting in St. Augustine, Fla., on March 20.
The *Master Car-Builders' Association*, annual convention, Alexandria Bay, N. Y., commencing June 12.
The *American Railway Master Mechanics' Association*, next annual convention, Thousand Islands, N. Y., June 19.
The *New England Railroad Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month.
The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, on the third Thursday of each month.
The Western Railway Club meets in Chicago the third Wednesday in each month.
The *Central Railway Club* meets at the Tifft House, Buffalo, the fourth Wednesday of January, March, May, August and October.
The *American Society of Civil Engineers* holds meetings on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.
The *Boston Society of Civil Engineers* holds its regular monthly meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m. on the third Wednesday of each month.
The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.
The *Engineers' Club of St. Louis* meets the first and third Wednesday of each month till June.
The *Engineers' Society of Western Pennsylvania* meets in Pittsburgh the third Tuesday of each month.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Albany, $2 per share, payable March 31.
Delaware & Hudson Canal, quarterly, 1¼ per cent., payable March 15.
Louisville & Nashville, 2 per cent., payable March 12.
West Jersey, semi-annual, 3 per cent., payable March 15.
Pittsburgh, Youngstown & Ashtabula, semi-annual, 3½ per cent., payable March 19.

Western Society of Engineers.

The 244th regular meeting was held Feb. 7. The following members were elected: E L. Corthell, William T. Casgrain and Charles Poore. Mr. Cooley for the Committee on National Public Works reported progress, and intimated that the Committee would report for instructions at the next meeting. A communication from a committee of the American Society of Civil Engineers, requesting the Western Society to join in a petition to Congress for special provisions in regard to rainfall observations, was referred to a special committee. Mr. Cooley gave a résumé of a brief upon the lakes and gulf waterway. Special committees were announced as follows: On Specification for Highway Bridges, C. L. Stroebel, E. C. Carter and A. Gottlieb. On Better Provision for Rainfall Observations, B. Williams, Charles McRitchie and L. E. Cooley.

The Boston Meeting of the American Institute of Mining Engineers.

This meeting, which was held last week, was well attended, and pleasant and profitable. The Institute was welcomed to Boston by General Francis A. Walker, and President Egleston responded for the Institute. Mr. J. C. Bayles read a paper describing the method of manufacture and advantages of spirally welded tubes, which his company is now manufacturing in sizes up to 20 in. diameter, and which it will be possible to make of any desired size and length. The welding is effected by hammering on an anvil block which has a reciprocating motion, and the heat is secured by a flame of water-gas and hydrocarbon gas. The process is said to produce tubes at a lower cost than the other methods and evidently makes a very perfect weld. Mr. H. M. Howe mentioned the method of making tubes by soldering together the strips of metal which are wound spirally to form the tube, and expressed the opinion that this method may be found serviceable in making gun barrels and for other purposes requiring great strength. The higher cost would interfere with their general use in competition with the welded tubes.

Mr. C. A. Ashburner read a paper on mine accidents, and Mr. R. P. Rothwell one on systems of mining in soft ore bodies, which elicited considerable discussion, in which it was stated that the method proposed, namely, a modification of the old system used in the coal mines of the south of France, has in principle been used with great success at Longdale, Va., and in the Lehigh hematite ore deposits.

Captain O. E. Michaelis read a paper on cast-steel guns, of which he is an ardent advocate.

Mr. Abbott described the new hot water distribution in Boston, where the company, of which he is engineer, has now about two miles of pipe laid. The work is a marvel of perfect work, and the results are of extreme importance. Many engineers were surprised at the statement that 75 horse-power is being delivered by this system of hot-water distribution through a copper pipe only ½ in. diameter.

The banquet on Wednesday evening was very largely attended.

Ninety-five new members were admitted and several of the remaining papers were read.

The officers of the Institute for the ensuing year are as follows: President, Prof. W. B. Potter, Washington University, St. Louis; Vice-Presidents, J. C. Bayles, New York; A. E. Hunt, Pittsburgh, and Prof. T. S. Hunt, Montreal; Managers, Robert Forsyth, Chicago; Kenneth Robertson, Birmingham, Ala., and C. M. Rolker, New York; Treasurer, T. D. Rand, Philadelphia; Secretary, R. W. Raymond, New York.

The report of the council showed that during the past year 200 members and 29 associates had been elected, while the roll of membership had been diminished by the deaths of 11 members and one associate. The receipts during the year amounted to $23,282.46; the expenses, $18,667,31, leaving a balance in the treasury of $4,615. The actual receipts of the year were $2,829.20 greater than the expenses. This increase is due partially to the larger number of members, and partially to the larger sale of publications, principally back volumes of the transactions.

Engineers' Club of Philadelphia.

At the regular meeting of Feb. 18 a variety of subjects was considered. Prof. Haupt presented by title the memoirs and papers relating to the national public works, which have been compiled by the Executive Board of the Council of Engineering Societies, and which were presented to the President last November. Mr. Ridgway presented an illustrated description of a direct acting steam crane. Mr. Johnson gave an account of the manufacture of sewer pipe by the Delaware Terra Cotta Co., and Prof. Haupt discussed the relative merits of salt glazing and slip glazing with Albany clay. There was a general discussion of pipe coatings. Mr. Henry G. Morris described some faulty arrangements in the hydraulic elevators of a new building in Philadelphia. The counterweight shafts are hung to the lower flanges of the beams which carry the head works of the four elevators, by means of two ¾ in. stud bolts. To the uncertainty of obtaining a good thread when it has to be made in place, there is added the uncertainty of its condition and of that of the bolts, by reason of the combination of "the monkey-wrench and the intelligent workman" who may have made the final adjustment. Some discussion was had upon water ways, particularly with reference to the Erie Canal and to the waterway from Lake Michigan to the Mississippi River.

Car-Axle Manufacturers.

The convention of car axle manufacturers, which has been in session in Pittsburgh for two days, adjourned on Feb. 25 without completing their national organization. Another meeting will be held at Cleveland, on March 6.

New York Railroad Club.

The subject for discussion at the next meeting of the club, March 15, will be: "Automatic Drawbars for Freight Cars and Uniform Couplings for Steam Heating of Passenger Cars."

PERSONAL.

—Andrew J. Stevens, General Master Mechanic of the Southern Pacific, died at Sacramento, Cal., Feb. 11, aged 54. He was a native of Vermont and first entered railroad service in 1850 as machinist apprentice at the Concord shops of the Northern of New Hampshire, but in 1854 went west and was for some time on the Chicago, Burlington & Quincy, first as foreman of the repair shops at Aurora, and afterwards as locomotive engineer. In 1861 he went to California, and after being connected with several local railroads and iron works in San Francisco, he joined the Central Pacific as division master mechanic in 1869, and was promoted to the post of General Master Mechanic the following year. Mr. Stevens was well known as the inventor of several ingenious systems of valve gearing and was a progressive and able mechanic, and was personally much respected by all who knew him.

—Mr. Wilson Eddy and his wife celebrated their golden wedding at their home in Springfield, Mass., on Feb. 25. Mr. and Mrs. Eddy have lived in the same house since 1840, when Mr. Eddy came to Springfield to take charge of the shops of the Western Railroad there. Mr. Eddy's career for 40 years on this road and its successor, the Boston & Albany, as master mechanic and locomotive builder, is well-known.

—Mr. C. L. Nichols, who has signed as Superintendent of the Eastern Division of the Atchison, Topeka & Santa Fe, was presented with a handsome silver tea set by the employés of his department. Mr. Nichols has been connected with the Atchison, Topeka & Santa Fe since 1880, holding various offices, and in January, 1887, was appointed to the position he has just resigned.

—President C. P. Clark, of the New York, New Haven & Hartford, sailed for Europe on Feb. 25.

ELECTIONS AND APPOINTMENTS.

Atlantic, Henderson & Virginia.—The following officers of this Kentucky company have been elected: President, William H. S. Burgwyn; Vice-President, Samuel Watkins; Secretary, J. R. Young; Treasurer, D. Y. Cooper.

Atchison, Topeka & Santa Fe.—R. D. Howe has been appointed Chief Engineer of the New Mexico Division, with office at Las Vegas, N. M.

F. A. Burgess has been appointed Superintendent of the Eastern division, with headquarters at Topeka, Kan., vice C. L. Nichols, resigned.

Atlantic, Atlanta & Great Western.—The following are the officers of this company. President, Col. George T. Fry; Vice-President, D. O. C. Heery; Secretary and Treasurer, John M. Bradley.

Berkeley Springs & Potomac.—The following directors have been elected: Samuel Whisner, B. F. Deford, D. Pratt Wright, J. R. Smith, R. Hunter, Geo. W. Hawvenale, Silas J. Hovennale, J. T. Trego, H. W. Disher, T. H. B. Dawson, G. F. Weber, Jr. The following officers were elected: President, B. F. Bedford, Baltimore, Md.; Vice-President, D. Pratt Wright; Secretary, J. T. Trego; Treasurer, Samuel Whisner.

Camden & Atlantic.—At the annual meeting held in Philadelphia last week the following directors were elected: George B. Roberts, William L. Elkins, Henry D. Welsh, Joseph N. DuBarry, Thomas H. Dudley, Richard D. Barclay, William C. Houston, William Bettle, Edmund E. Read, William C. Dayton, Crawford Miller, Enoch A. Doughty and John B. Hay. The directors organized by electing the following officers: President, George B. Roberts; Vice-President, William J. Sewell; Secretary, Daniel M. Zimmerman; Treasurer, William Taylor.

Central Missouri.—H. G. McPike, Alton, Ill., R. W. Webb, New York, and R. P. Williams, Fayette, Mo., have been elected directors, the latter succeeding John D. Perry, esigned.

Cherokee & Dakota.—At the annual meeting held in Dubuque, Ia., the following directors were elected: E. T. Jeffrey, W. J. Knight, M. Gilleas, F. W. Quimby, W. R. Pollmyer. The directors elected the following officers: President, W. J. Knight; Vice-President and General Manager, E. T. Jeffrey; Secretary, E. P. Skene; Treasurer, Henry DeWolf.

Chicago, Kansas & Nebraska.—The following appointments have been made: H. A. Parker, General Manager, with headquarters at Topeka, Kan., vice C. W. Fisher resigned; E. St. John, Assistant General Manager, with headquarters at Chicago; William M. Sage, Traffic Manager, with office at Chicago.

Chicago, Milwaukee & St. Paul.—Oscar Sanne has been appointed Assistant Engineer, with headquarters at Milwaukee, Wis.

Chicago, Rock Island & Pacific.—The following appointments have been made: William M. Sage, General Freight Agent, to be Traffic Manager; J. M. Johnson, First Assistant General Freight Agent, to be General Freight Agent; H. Gower has been appointed First Assistant General Freight Agent, and E. Macpbetridge, Second Assistant.

Choctaw Railroad & Coal.—The incorporators of this company are as follows: Samuel Sbellenberger, S. G. Eddy, John R. Carr, Joseph A. Euper, James J. Campbell and E. D. Chadick, of Denison, Tex.; George B. Kirkbride, F. B. Lewis, John Washington and Jack A. Wolverton, of Minneapolis, Minn.

Cincinnati, New Orleans & Texas Pacific.—R. H. Garrett has been appointed Division Passenger Agent of this system, with headquarters at New Orleans.

Cleveland, Akron & Columbus.—Joseph M. O'Boyle has been appointed Auditor.

Dayton, Fort Wayne & Chicago.—R. D. Marshall, of Dayton, O., General Solicitor of the Cincinnati, Hamilton & Dayton, has been appointed Receiver. J. E. Gimberling will retain his position as Superintendent.

Denison & Sherman.—The officers of this Texas company are as follows: President, W. B. Munson, Denison, Tex.; Vice-President, Paul Waples; Secretary, H. T. V. Perry, Denison, Tex.

Denver & Rio Grande.—J. E. Hubbard has been appointed Superintendent of Bridges and Buildings, with headquarters at Denver, Col.

Detroit & St. Clair River.—The officers of this company are: President, C. McElroy, St. Clair, Mich.; Vice-President, L. B. Parker, Marine City, Mich.; Treasurer, Mark Hopkin, St. Clair, Mich.; Secretary, William Grace, St. Clair, Mich.

Dubuque & Sioux City.—At the annual meeting held in Dubuque, Ia., the following directors were elected: W. J. Knight; E. C. Woodruff, S. H. Harriman, W. D. Guthrie, Albert Wilcox, Stuyvesant Fish, John Anthon, H. F. Webster, S. V. R. Cruger.

Elgin, Joliet & Eastern.—C. L. Nichols has been appointed General Superintendent, with headquarters at Joliet, Ill.

Eastern Minnesota.—The following are the officers of this company: Henry D. Minot, President; Frank E. Ward, Secretary; Howard James, Treasurer; C. K. Lawrence, General Superintendent; Samuel Rockwell, Superintending Engineer, of St. Paul, Minn.

Fort Hamilton & New York Elevated.—Among the directors of this company are John J. Allen, E. B. Litchfield and William B. Litchfield.

Fort Worth & Denver City.—John McCormic has been appointed Superintendent of Transportation and Telegraph, with headquarters at Denver, Col.

Gainesville & Southeastern.—The directors of this Texas company are as follows: F. A. Tyler, F. W. Dougherty, J. M. Lindsey, Curtis Blackwood, C. C. Hemming, J. R. Stevens, F. L. Cleaves, J. H. Hirde and J. T. Walker, of Gainesville, Tex.

Georgia Southern & Florida.—The following are the officers of this company: President, W. B. Sparks; Treasurer, Henry L. Jewett; General Manager, J. Lane; Chief Engineer, William A. Wells. Headquarters, Macon, Ga.

International & Great Northern.—C. W. Kouns has been appointed Division Superintendent.

Iowa Falls & Sioux City.—At the annual meeting in Dubuque the following directors were elected: Stuyvesant Fish, John Elliott, S. H. Harriman, E. T. Jeffery, Walthar Lutgen, S. V. R. Cruger, Sidney Webster.

Jacksonville & Gulf.—The incorporators of this Florida company are: W. T. Sylvester, J. W. Sylvester and E. W. Ebbetts, Jacksonville, Fla.; J. W. Maclay, Yonkers, N. Y., and Wm. E. Davies, Demarest, N. J. The first board of directors are: W. T. Sylvester, J. W. Sylvester and William E. Davies.

Karshner, Washington & Chicago.—The following are the officers of this company: President, W. P. Cutter, Marietta, O.; Vice-President, John Karshner, Adelphi, O.; Secretary, Frank Johnson, Washington C. H., O.

Lansing, St. John's & Northern.—The officers of this Michigan company are: President, A. W. Sparrow; Vice-President, Fred Roman; Secretary, Frank I. Dodge; Treasurer, E. F. Cooley; General Manager, A. Bement; offices at Lansing, Mich.

Lehigh Coal & Navigation Co.—At the annual election in Philadelphia, this week, the following officers and directors were elected: President, Joseph S. Harris; Vice-President, Francis C. Yarrall; Directors, Edward W. Clark, Francis R. Cope, Fisher Hazard, Charles Parrish, James M. Willcox, Edward Lewis, T. Charlton Henry, Samuel Dickson, Edward B. Leisenring and Abram S. Hewitt.

Lehigh & Wilkesbarre Coal Co.—J. Rogers Maxwell has been appointed President, vice William H. Tillinghast, resigned.

Louisville, New Orleans & Texas.—C. M. Hunt has been appointed Chief Train Dispatcher.

Messila Valley, White Oaks & Eastern.—The incorporators of this company are Numa Raymond, Martin Lohman, W. L. Rynerson, John B. Bowman and Frank W. Smith, of New Mexico.

Mexican International.—The organization of the Traffic Department of this company is as follows: J. C. Stubbs, General Traffic Manager, San Francisco, Cal.; J. A. Naugle, General Freight and Passenger Agent, Piedras Negras, Mexico; E. Hawley, General Eastern Agent, New York; S. W. Eccles, General Agent, City of Mexico.

Mexican National.—Mr. J. C. Munro has been appointed Superintendent of Motive Power and Machinery, with office at Laredo, Mexico.

Missouri Pacific.—J. M. Eddy has been appointed General Agent at Omaha. The office of commercial agent at Omaha has been abolished.

Mobile & Ohio.—The office of Superintendent is abolished. A. B. Wilmer has been appointed Car Accountant, with office at Mobile.

F. E. Chapman has been appointed General Agent, with headquarters at Chicago, Ill.

New York, New Haven & Hartford.—The office of General Agent has been created, and Albert G. Tuttle has been appointed to the position, with office at New Haven.

New York, Susquehanna & Western.—At the annual meeting held in Jersey City last week the following board of Directors was elected: Frederic A. Potts, Stephen V. White, Simon Borg, Charles Minzenheimer, Henry Marks, Henry Sanford, Robert H. Dow, Charles Seidler, John I. Blair, Garret A. Hobart, Alfred Sully, James M. Hartshorne and Horatio S. Pierce. F. A. Potts was elected President: S. V. White, Vice-President, and J. P. Rafferty, Secretary.

Northern Central.—At the annual meeting held in Baltimore last week the old board of directors was re-elected, except that Louis W. Hall succeeded Henry Gilbert, deceased. George B. Roberts was elected President.

Northern Minnesota.—The following are the incorporators and first board of directors of this Minnesota Company: L. B. Riddell, L. N. Eklund, C. J. McCallum, E. W. Jadis, George Thompson, John Western, Wm. F. Kelso, Ed. H. Love, C. G. L. Kelso, of Hallock, Minn.; Charles S. Douglas, of Emerson, Province of Manitoba.

Pueblo, Gunnison & Pacific.—The incorporators of this Colorado company are: Charles Henkle, H. R. Holbrook, M. P. Fitch, O. H. P. Baxter and John A. Gray, of Pueblo.

St. Joseph & Grand Island.—William Lush, Chief Engineer, has been appointed Acting General Manager.

St. Louis, Iron Mountain & Southern.—T. W. Keenan, late of the New York, New Haven & Hartford, is to be Superintendent of the Eastern division.

San Antonio & Aransas Pass.—L. J. Polk has been appointed Assistant General Freight Agent.

Southern Pacific.—H. A. Smith has been appointed Contracting Agent in Los Angeles, vice George W. Luce resigned.

J. J. Finn has been appointed Trainmaster at San Pedro, Cal.

South River Terminal.—The incorporators of this Maryland company are Theophilus Tunis, E. T. Toadvin, Joseph E. Seth, E. L. Tunis and T. A. Seth.

Terre Haute & Peoria.—At the annual meeting held in Decatur, Ill., last week, the following officers were elected: C. W. Fairbanks, President; D. H. Conklin, Vice-President, General Manager and Treasurer: A. Stevens, of Decatur, Secretary, and E. W. Dithridge, of New York, Assistant Secretary.

Western New York & Pennsylvania.—J. T. Gardner has been appointed Division Superintendent, with headquarters at Oil City, Pa., vice E. H. Witter, transferred to Buffalo.

Wheeling & Pittsburgh Junction.—The following officers have been elected: W. M. Clements, President; R. T. Devries, Vice-President; F. M. Hildebrand, Secretary, and W. H. Ijams, Treasurer.

OLD AND NEW ROADS.

New Companies Organized.—Fort Hamilton & New York Elevated is organized.—Lansing, St. Johns & Northern is incorporated.—Northern Minnesota flies articles of incorporation in Minnesota.—Pueblo, Gunnison & Pacific is chartered in Chicago.—South River Terminal is chartered.

Aberdeen, Bismarck & Northwestern.—A bill has been introduced in Congress granting this company the right to bridge the Missouri at Winona, 40 miles south of Bismarck. The move for bridging the Missouri is taken as indicating the intention to push the system into the cattle ranges of western Dakota and Montana.

Anaheim, Olinda & Pomona.—The grading has been commenced on this California road, which is to extend from a point near Long Beach via Anaheim and Olinda to Pomona.

Aspen & Western.—This branch of the Denver & Rio Grande, extending from Carbondale, Col., a little north of Aspen, about 16 miles west to the Thompson Creek coal mines, has been finished.

Atchison, Topeka & Santa Fe.—The Los Angeles *Herald* gives the following summary of the condition of the new lines of this company's California roads, the California Southern and California Central: "The work of construction of the Atchison, Topeka & Santa Fe branches in this region is progressing finely, and it is believed that a few weeks more of favorable weather will enable all the work to be finished. Much delay has been caused by the scarcity of building materials, but plenty of material is now on hand at San Diego to finish every foot of track now being built. There are now 10,000 tons of steel rails at San Diego and a large number of ties are expected daily. From present prospects the new line to San Diego will be in operation within the next ninety days. Just outside of this city is a large force of graders with sixty teams. This force will strike the city boundaries Friday, and by Saturday night the line will be graded to its connection with the Ballona branch

This will complete the grade from this city to Fulton Wells. A large force of men will be soon put to work at Santa Fe Springs to grade toward Anaheim. Five miles of the grade from Anaheim toward Santa Fe Springs is now complete, and distance the force at the last-named place will have to grade before the connection is made is about seven miles. From Anaheim to Orange the distance is about four miles, and in three weeks' time it will be completed. When this is finished, the entire grade from this city to Orange will be ready for the track. At Orange the road connects with that part of the line already in operation to San Juan By-the Sea. The road from San Juan By the-Sea to Oceanside is almost ready for the rails. The grading is finished, but work on the large bridges and trestle has been much delayed by lack of material. One of these bridges is about 90 ft. high, and the other is 1,200 ft. long. When they are finished the road will be ready for the rails all the way, but before that time—by next Thursday—a force of men will start at a point three miles south of San Juan By-the-Sea to lay the track to Oceanside.

"As soon as the grade is finished to this city and to Anaheim, a portion of the graders will be sent to Inglewood to lay the rails from that place to Redondo Beach. The grading to that place will be completed in two weeks. There are no bridges or trestle work to be constructed, and the tracklaying can be accomplished very rapidly In a week a force of men will commence laying track to San Jacinto from Perris, and the road will be completed in about ten days and ready for operation. The distance is only 18 miles, but the line passes through a most valuable part of the country. The road to Mentone from San Bernardino is completed, and the tracklayers will be sent elsewhere at once. Thus it will be seen that the Santa Fe Company is soon to have several new branches open, and the statement that ninety days is sufficient time in which to complete the work now on hand is not at all extravagant.

Atlantic, Henderson & Virginia.—This company will receive bids for building its road from Henderson, Vance County, N. C., to a connection with the Atlantic Coast Line at a point not yet decided upon.

Atlantic & Pacific.—A Boston dispatch states that an Equipment Trust has been formed to furnish the road with 50 new engines, to be paid for in 16 semi-annual payments, with interest at 6 per cent. It is also stated that 1,200 new cars will be bought, to be paid for by the company's notes maturing at about the same rate—that is, payments to be completed in 8 years.

Baltimore & Ohio.—President Spencer has submitted a proposition to the City Council of Baltimore asking that body to extend for 50 years the $5,000,000 loan, secured by six per cent. bonds which mature in two years, the new bonds to be issued at four per cent. President Spencer also asks that the sinking fund to pay off this debt, and which now amounts to $2,500,000, be given back to the company when the new bonds are issued.

Blackville, Alston & Newberry.—It is reported that this company is negotiating for the purchase of the Barnwell road, which extends from Barnwell, S. C., to Blackville, 9 miles, and is at present owned and operated by the South Carolina, with the object of extending its road to Savannah, Ga. J. H. Averill, Charleston, W. Va., is Superintendent.

Bowling Green & Northern.—This is a road projected to extend from Bowling Green, Ky., to the Ohio River.

Burlington & Missouri River.—The contract to build an extension of this road between Ashland and Nebraska City has not yet been let.

Cape Girardeau & South Western.—We have received a letter from President Houck, of this company, and we republish it below, omitting some complimentary references to this journal:

"We intend to build this road to a connection with the Current River Railroad, a branch of the Kansas City, Springfield & Memphis, starting from a point known as Willow Springs, and running thence to Lee, in Carter County, Mo. Our road starts from Cape Girardeau and runs in a southwestern direction to the St. Francois River, thence up that river to Otter Creek, to which point it is now completed; from there it extends to Williamsville on the main line of the Iron Mountain road, and thence across the country to a point about ten miles southeast from Van Buren, in Carter County, where it will connect with the Current River branch. The location from Otter Creek west has just been finished and most of the contracts are let. The principal contractors are J. Zimmerman & Co. and Patrick O'Hare. The road is being built mainly with local means, and we have secured the car equipment from car trust companies. We have worked well on local business and we now are about to struggle for western business, as soon as we secure the connection with the Current River Railroad alluded to.

Cedar Rapids & Chicago.—Amended articles of incorporation have been filed in Iowa, increasing the capital stock from $1,000,000 to $1,500,000. The road has lately completed its line from Cedar Rapids to Manchester, Ia.

Charleston, Cincinnati & Chicago.—Samuel Hampton, Rutherfordtown, N. C., has contracted to grade 6 miles of this road.

Chattanooga, Rome & Columbus.—The Chattahoochie Brick Co., who are under bonds of $125,000 to complete this road between Chattanooga and Carrollton by July 1, 1888, have sublet their contract as follows, commencing from Chattanooga: S. S. Eaton, 10 miles; — Redmond, 10 miles; D. J. McDonald, 15 miles; L. Rossiter, 16 miles; Marshall & Foster, 5 miles; R. M. & J. N. Brooks, 5 miles; J. H. Powers, 10 miles, which will complete the road as far as Rome, from which point to Cedartown, 35 miles, it is in operation. Between Carrollton & Columbus the road has not yet been located, but it is expected that the contract will be let this year. Track is being laid at Chattanooga and Cedartown.

Chesapeake & Ohio.—The success of the reorganization plan seems to be practically assured, although there is opposition by some of the smaller stockholders. It is expected that the construction of the bridge at Cincinnati will be authorized soon.

Chicago & Eastern Illinois.—Work has been commenced on a branch road to extend from Momence on this road to Goodall on the Chicago & Indiana Coal. At present the latter road uses the tracks of the Cincinnati, Indianapolis, St. Louis & Chicago, from Swannington to Chicago, but when this road is completed the traffic will be turned over to the Chicago & Eastern Illinois.

Chicago, Hannibal & Springfield.—The subscriptions to this road from six of the counties along its line amount to $545,000, and the right of way has been granted by Ralls and Marion counties, Mo., R. C. Nickerson, Chicago, Ill., is President.

Chicago & New Orleans.—It is stated that the survey for this road will commence in the spring, and that it will be completed to McLeansborough by Sept. 1. The road is to extend from Effingham, Ill., southeast to a point on the Ohio River in Massac County. The general offices are at Springfield, Ill.

Chicago, Rock Island & Pacific.—The southern extensions of this company will stop for the present at the Indian Territory line. We learn from the officers of the company that the western extensions to Denver and Colorado Springs have not yet been decided upon, and will not be for some time. There is no truth in the story that the road contemplates an extension to the Pacific coast. It has been building largely through Kansas and Nebraska during the last year, and the intention is to operate the new lines in conjunction with the entire system, rather than to make any extended additions to the track.

Chippewa Falls & Ashland.—The right of way is being secured for this road, which is to extend from Chippewa Falls, Wis., on the Chippewa Valley division of the Wisconsin Central, north to Ashland, about 130 miles, and it is expected that contracts will be let in the spring. L. J. Rusk, Chippewa Falls, Wis., is secretary.

Cleveland, Akron & Columbus.—The work of arching the tunnel on the Dresden branch has been completed. Tracklaying will be soon commenced through it and is expected to be completed by April 1. The branch extends from Killbuck, O., in Holmes County, on the main line of the road, to Dresden, in Muskingum County, about 34 miles.

Colorado Midland.—It is expected that the extension of this road from Glenwood Springs, Col., its present terminus, which is 86 miles from Leadville and 221 miles from Colorado Springs, west to New Castle, will be completed in April.

Columbus.—This company is building a standard gauge belt road about Columbus, Ga., 10 miles long, using 40-lb. steel rail.

Columbus & Marysville.—The location of the extension of this road from Sardinia to Georgetown, O., has been completed, and the right of way is being secured. A preliminary survey has been completed from Georgetown to Ripley, O. James I. Marshall, Hillsboro, O., is Superintendent.

Columbus & Western.—An opening has been made in the Coosa Mountain Tunnel, and trains are expected to be running through it shortly, as the track has been laid to within a few miles of it on each side. It is 2,300 ft. long.

Cooperstown & Susquehanna Valley.—This company will extend its road from Cooperstown, N. Y., about four miles, to make a connection with the Ulster & Delaware extension, which is building from Stamford.

Covington & Macon.—Martin & Porter, who were recently awarded the contract for grading this road through Madison, Ga., have commenced work between that place and Shady Dale.

Cumberland Valley & Martinsburg.—The Martinsburg & Potomac has been reorganized under this name, and it is said that the extension to Winchester will probably soon be commenced. It is a leased line of the Cumberland Valley, and T. B. Kennedy is President.

Denison & Sherman.—The preliminary surveys for this road have been completed from Denison, Tex., south to Sherman, about 9 miles. The route is west of the Houston & Texas Central. The contracts are expected to be let within 30 days. The road is intended to connect the Denison & Washita Valley with the St. Louis, Arkansas & Texas. The officers are given in another column.

Detroit & St. Clair River.—The right of way for this road, which is to extend from Detroit, Mich., northeastwardly near the shore of the river to St. Clair, 43 miles, is being secured. Preliminary surveys have been made, but it has not been decided when contracts will be let. Drawbridges will be required at Mount Clemens and Marine City.

Duluth, Red Wing & Southern.—The survey for this road has been completed except 67 miles south of Duluth. The contract has not yet been let, but a construction company is being formed, and it is expected that work will be commenced early in the spring.

East Alabama.—Chief Engineer B. H. Hardaway is locating the line for the 35 miles between Roanoke and Anniston, Ala., and construction work will be commenced when the location has been completed. The road will extend from Opelika to Anniston, about 90 miles.

East Louisiana.—This road will be extended to Franklinton, La., 25 miles north of Covington, its present terminus, and probably to a point near Forest, Miss., on the Vicksburg & Meridian. It will not at present be extended to a connection with the Illinois Central, as we reported last week. John Poitevent, New Orleans, La., is President.

Farmville & Powhatan.—Contracts for grading this road have been let to Strother, Van Doren & Strother, of Dorset, Va., and to Mr. Vedder, of Skinquarter, Va.

Fitchburg.—New machine shops will soon be erected at Troy, where all the machine work of the western division will be done. A roundhouse capable of accommodating 14 locomotives will also be built there.

Fort Hamilton & New York Elevated.—Articles of incorporation have been filed in New York to build a road from Fort Hamilton to South Ferry, Brooklyn, with a branch to New Utrecht avenue, a distance of eight miles. The capital stock is $500,000.

Fort Worth & Rio Grande.—The President of this road, Capt. B. B. Paddock, is at present in New York making arrangements for the extension to Brownwood, Tex., on the Gulf, Colorado & Santa Fe, about 108 miles, or to San Angela. The road is in operation between Fort Worth and Granbury, Tex., about 40 miles. The general offices of the company are at Fort Worth, Tex.

Georgia Southern & Florida.—The tracklaying on twenty miles of this road has been completed, and work is progressing on another 150 miles, the greater part of which has been graded, and the remaining 130 miles are being located. The road is projected to extend from Macon, Ga., through Hayneville, Vienna, Cordele, Arabi, Sycamore and Jasper, to Palatka, Fla., from which point it is said it may be extended to Bartow, Fla. The general offices are at Macon, Ga. William H. Wells is Chief Engineer.

Grand Trunk.—The shareholders of this company and of the Northern & Northwestern system have approved of the fusion of the two companies. The Northern & Northwestern operates 382 miles of road. This road and the Hamilton & Northern are operated under a joint working agreement by which the Northern & Northwestern receive 70 per cent. of the earnings.

Hardinsburgh & Southwestern.—This is a projected road to extend from Irvington, Ky., on the Louisville, St. Louis & Texas, through Hardinsburgh, to a connection with the Owensboro, Falls of Rough & Green River near the latter place.

Hawesville & Pellville Mineral.—This road, projected to extend between Hawesville and Pellville, Ky., will be extended from the latter place to Sulphur Springs and Hartford, Ohio County, Ky., to a connection at Beaver Dam or Caneyville with the Chesapeake, Ohio & Southwestern. D. L. Adair, Hawesville, Ky., is President.

Houston & Texas Central.—It is stated that the assessment which will be required of the stockholders will be about 40 per cent. on the new issue of $10,000,000 of common stock provided for under the reorganization plan.

Illinois Central.—The long standing controversy over the alleged rights of this road to the lands and waters along its line in Chicago, from Sixteenth street to its terminal station, has been partially cleared up by a decision of Judge Harlan, of the United States Supreme Court, sitting with the District Court. The Judge holds that the company's rights are good as to the properties north of Randolph street, and between Park Row and Sixteenth street; but that the city lawfully holds title of the land between Randolph and Park Row, together with the riparian rights of that property.

While this decision shuts out the road from the outer harbor, it confirms its possession of its heaviest and most immediately important improvements and artificial lands.

Illinois Central.—Proxies to be used at the annual meeting to be held in Chicago, March 14, are asked to be made out in the name of Stuyvesant Fish and Edward H. Harriman.

Isbell & Iron Mountain.—The grading on this road, which is to extend from Isbell, Ala., on the Sheffield & Birmingham to the headwaters of Hamilton Creek, 7 miles, is now in progress. John E. Isbell, Isbell, Ala., is General Manager.

Jacksonville & Gulf.—This company, lately incorporated in Florida, will build a road from Jacksonville, southerly through Duval and St. Johns counties to or near Palatka, thence southwesterly through the counties of Putnam and Marion to Ocala, about 155 miles. The capital stock is $1,000,000.

Kansas City & Bonner Springs.—The preliminary survey of this road will be commenced immediately by Holland Wheeler, of Kansas City, Mo.

Kansas City, Memphis & Birmingham.—Machine shops will be erected by this company at Memphis, Tenn. R. H. Briggs is Master Mechanic.

Kansas City & Southeastern.—This road is being built from Kansas City, Mo., to Hart Grove, Mo., about 11 miles, and the track has been completed between Westport and Waldo Park, 5½ miles. The rest of the road is not under construction, but will probably be finished this year. It is a branch of the Kansas City & Southern, and gives that road another entrance into Kansas City. B. R. Whitney, Kansas City, is Chief Engineer.

Kansas City & Southern.—This road will be extended to Kansas City, Mo., from East Lynne, about 50 miles, and will be completed by July 1. Schnellbacher & Gilman, Kansas City, Mo., are the contractors. The road is in operation between East Lynne and Osceola, about 60 miles. B. R. Whitney, Kansas City, Mo., is Chief Engineer.

Kansas, Lawrence & Texas.—It is stated that this road has changed its route so as to extend from Topeka through St. Clerc, Havensville, Frankfort, Marysville, Hanover and Hebron, Neb., with offices at Havensville.

Karshner, Washington & Chicago.—This road is projected to extend from Washington, O., to Marietta. The road runs through the Hocking and Federal Valley coal fields, and the right of way is now being secured.

Kentucky.—Bills have been introduced in the Kentucky Legislature to incorporate the following companies: Henderson Belt; Cairo & Memphis; Vincennes, Oakland City & Owensboro.

Kentucky Midland.—It is expected that the contracts for this road will be let as soon as the surveyors finish the location. They are now at work west of Owingsville, from which point it is about 15 miles to the state line, where the road ends.

Knoxville Southern.—Bergen & McFarland have commenced work on their contract for grading 5 miles of this road.

Lansing, St. Johns & Northern.—Articles of incorporation have been filed in Michigan to build a line from Lansing, Mich., north through St. Johns, on the Detroit, Grand Haven & Milwaukee, on, via Maple Rapids, Clinton County, to Ithaca. The capital stock is $500,000, of which $25,000 has been paid in.

Lincoln, Red Oak & Des Moines.—The surveyors are locating the line between Lincoln, Neb., and the Missouri River. It is expected that the road will be constructed to a connection with the Chicago, St. Paul & Kansas City at Des Moines, this year.

Long Beach, Whittier & Los Angeles.—This branch road of the Southern Pacific has been opened for traffic between Bernard, the junction with the Wilmington division, to Long Beach, a distance of 38 miles.

Louisville & Nashville.—It is said that a large part of the Louisville, Cincinnati & Lexington division is to be double tracked.

Louisville, St. Louis & Texas.—About 80 per cent. of the bridging and grading of this road has been completed between Owensboro and West Point, Ky., a distance of about 88 miles, and the ties are on the ground. It is expected that the entire line will be in operation by October next. Twenty miles of the Chesapeake & Ohio track, between Louisville and West Point, will be used under a temporary contract. J. C. Fawcett, Louisville, Ky., is President.

Manchester & Lawrence.—This company has filed a bill in equity in New Hampshire, claiming that the Concord road, to which it was leased, has not properly accounted for the rolling stock and supplies transferred to it in 1854, and that the operating contract in other respects has not been complied with.

Maryland.—Bills have been introduced in the Maryland Legislature to incorporate the Baltimore, Brooklyn & Cedar Hill and the Emmitsburg roads.

McKeesport & Bellevernon.—The contract of Drake & Stratton, McKeesport, Pa., includes the bridging and grading for the whole line, about 30 miles.

Mexican Central.—The track on the Guadalajara branch has been laid for a distance of 109 miles, and the grading has been finished to a point 15 miles further on.

Messila Valley, White Oaks & Eastern.—This company has been organized to build a road from Las Cruces, New Mexico, to White Oaks, and to a connection with a road in the Panhandle of Texas, about 400 miles. The capital stock is $300,000, of which 10 per cent. has been subscribed.

Mexican International.—The road will be opened for passenger traffic through to Torreon, Mex., March 1. Connection will be made at Eagle Pass with the Southern Pacific passenger trains and at Torreon with those of the Mexican Central. A daily passenger train will be run each way and a through line of sleepers will be operated from New Orleans to the City of Mexico, although final arrangements for this service have not been announced. The distance from the Rio Grande to Torreon is 383 miles, and from Torreon to the City of Mexico 1,021, and on the Mexican Central from El Paso to Torreon it is 201 miles. By the new route the distance from New Orleans to the City of Mexico will be shortened about 550 miles, and from St. Louis about 400 miles. The International crosses the Rio Grande at Eagle Pass on an iron bridge 930 ft. long, which was built in 1883, and over the Sabinas is another iron bridge, shorter, but with longer spans. An iron bridge over the Lampazas is constructing. A line of 156 miles is located to Durango and a branch to Saltillo is partly completed. Much of this is through a country still undeveloped, but it is expected that a valuable traffic in cotton and minerals will soon be secured from the region directly north of Torreon.

Minneapolis & Pacific.—The rumor that this company is to be absorbed by the St. Paul, Minneapolis & Manitoba is pronounced to be wholly without foundation.

Mississippi & Gulf.—This company has been incorporated in Mississippi to build a road from Natchez to the Gulf of Mexico. It will pass through a country with comparatively few railroads.

Missouri Pacific.—The construction of the branch from Talmage, Neb., to Crete, on the Burlington and Missouri River, will probably be resumed at an early date. The line has been surveyed and graded and many of the rails are on the ground.

Mobile & Birmingham.—A large force is at work on this road between Birmingham and Marion Junction. It is completed from the latter point to Mobile.

Montgomery & Florida.—Mr. David A. Boody, a large bondholder of this road, is reported in an interview as saying that the suits of the contractors McLaren & McLaren had been settled and that the road would be in the hands of the bondholders after the May term of the Circuit Court. The company proposes to widen the gauge between Highland and Montgomery.

Nashville, Chattanooga & St. Louis.—A general meeting of the stockholders will be held in Nashville, on March 21, to consider the question of ratifying the purchase of the Duck River Valley Narrow Gauge and the Nashville & Tuscaloosa, and changing the gauge of the former and issuing a consolidated first mortgage bond. The former road is leased to this company and the latter is owned in fee simple.

Nashville & Charleston.—This road is projected to extend from Nashville, Tenn., through Rockwood on the Cincinnati, New Orleans & Texas Pacific, Sweetwater, Tenn., on the East Tennessee, Virginia & Georgia, Bushnell, N. C., on the Western North Carolina, and through the Unaka Mountains to Walhalla, S. C., on the Columbus & Greenville, thence southeast through Anderson, Abbeville, Aiken, Barnwell and Waterloo, S. C., to Charleston, a total distance of about 590 miles. Preliminary surveys have been made between Nashville and Walhalla. The location is being made between Sweetwater and Bushnell, about 76 miles, and contracts for this part will probably soon be let. William H. Case, Knoxville, Tenn, is Chief Engineer.

Nashville & Knoxville.—The tracklaying on this road, which is to extend from Lebanon to Knoxville, Tenn., with several branches, has been commenced, and it is expected that 40 miles will be in operation by July 1. Surveys are being made for the branches, and contracts for grading will be let soon. Charles J. Allison is Chief Engineer.

New Roads.—A road is projected to extend from Wallace, Escambia County, Ala., on the Louisville & Nashville, to Little River.

A. S. Challser is securing the right of way for a road to extend from Middleburg, Fla., to a connection with the Florida Railway & Navigation Co.'s road at Maxville, Duval County.

New Roads.—It is said that Burke, Hart & Co., of Shohola Falls, Pike County, Pa., will probably build an eight-mile road to connect with the New York, Lake Erie & Western at Shohola.

New York & Long Branch.—A traffic agreement, which provides for a joint guarantee of interest upon the bonds and interest on the stock of this road is said to have been made between the Pennsylvania and the Central of New Jersey. The suits of the Pennsylvania to annul the last arrangement have been withdrawn.

New York, New Haven & Hartford.—The contract to build the new depot at Hartford, Conn., has been let to Messrs. Norcross Bros., of Worcester, Mass., for $199,000, the building to be finished by December, 1888, under a forfeiture of $50 a day for failure to comply with the agreement. The contract includes everything except the heating apparatus and decorations.

New York, Rutland & Montreal.—It is stated that this road will probably be put in operation in a few days under the management of the Rennington & Rutland. The road has been in the hands of the sheriff for some time.

Northern Minnesota.—Chartered in Minnesota to build a road from Emerson near the International boundary line south through the counties of Marshall and Polk. The capital stock is $1,000,000.

Old Colony.—Repair shops will be located at Braintree, Mass.

Oregon & Washington Territory.—The track on this road has been finished to a point 22 miles beyond Walula, Wash. Ter., and the contractor, G. W. Hunt, Portland, Or., will soon put a force at work to finish the ballasting and surfacing.

Oxford & Clarksville.—O. L. Wright & Co., who were reported last week as receiving the contract to build the extension of this road from Oxford to Durham, 23 miles, will sub-let the contract.

Pueblo, Gunnison & Pacific.—Articles of incorporation have been filed in Colorado by this company, mentioned last week, to build a road from Pueblo west over Sand Hill Pass, in the Sangre de Christo Range to San Prisvilla and through Masco and Cochetope passes to Gunnison, with branch lines to Pagosa Springs, Lake City and Ouray. It is said that work will be commenced immediately. The capital stock is $5,000,000.

Rio Grande & Eagle Pass.—It is stated that this road, which extends from Laredo, Tex., to Santa Thomas, a distance of 27 miles, will probably be extended to coal fields, about 25 miles. N. S. Giddens, Laredo, Tex., is Superintendent.

Rochester & Glen Haven.—It is expected that this road will be completed and in operation by June 1. The road is to extend from Rochester to Glen Haven, a distance of about 3½ miles. The company intends to build an hotel at Glen Haven.

Rochester & Honeoye Falls.—The surveys for this road from Rochester, N. Y., to Honeoye Falls, a distance of about 16 miles, have been completed and the location is now being made.

Rockwell, Sioux City & Des Moines.—Organized at Rockwell City, Ia., to construct a road from Rockwell to Sioux City.

St. Augustine & Atlantic Coast Line.—Work will probably be commenced on grading and clearing the right of way for this road from St. Augustine, Fla., to New Smyrna, on the Atlantic & Western of Florida, about 85 miles. H. M. Flagler, of the Standard Oil Co., is building the road.

St. Joseph & Grand Island.—It is stated that a survey is being made for a new route between Hiawatha and Seneca, Kan., 43 miles, in order to avoid the heavy grades.

St. Louis, Arkansas & Texas.—The branch of this road which leaves the main line of the road at Altheimer, a little north of Pine Bluff, and extends northwest to Little Rock, is very nearly completed, but a few miles of track remaining to be laid.

San Antonio & Aransas Pass.—The location of this road, between Houston, Tex., and Piny Point, about 22 miles, has been commenced, and it is expected that trains will be running to Houston by August. It is stated that the road will then be extended to Natchez, Miss., through Alexandria, La.

Sheffield & Birmingham.—The tracklaying has been completed from Sheffield, Ala., to a point about 17 miles from Jasper. The extension to Cardova has been located and the contract let to Messrs. Fudge & Strange, who will begin grading in a few days.

Shreveport & Arkansas.—The track has now been completed from Lewisville, Ark., on the St. Louis, Arkansas & Texas, to a point 27 miles from Shreveport, La., and is being laid at the rate of about ⅔ mile a day. It is expected that the road will be completed and in operation to Shreveport in April.

South Atlantic & Northwestern.—It is expected that this company will commence work on its road in the spring. It is projected to extend from Southport, on the North Carolina coast, near Cape Fear, to Bristol, Tenn. Waldorf H. Phillips, New York, is President.

South River Terminal.—Articles of incorporation have been filed in Maryland to build a road from a connection with the Annapolis & Baltimore Short Line at Annapolis to the South River, near St. Thomas' Point, a distance 4½ miles. The capital stock is $100,000.

Terre Haute & Mississippi River.—The proposition to give this company a subsidy of $100,000 was defeated in Vigo County, Ind., last week. The road is projected to extend from Terre Haute to Centralia, Ill.

Vancouver, Klickitat & Yakima.—The contract to construct the first 23 miles of this road from Vancouver to Lewisville, Clarke County, Washington Territory, has been taken by the Northwestern Improvement Co., of which E. L. Canby, Vancouver, W. T., is president.

Washington County.—A meeting of the stockholders of this Maryland road (operated by the Baltimore & Ohio) will be held at 38 Wall street, New York, on March 19, to vote on the authorization of $2,000,000 first mortgage bonds.

Wheeling & Lake Erie.—At the special meeting of the stockholders, to be held at Toledo, March 21, the construction of the extension from Bowestown southeast to Wheeling will be considered, and also the proposition to convert the outstanding 36,000 shares of stock into preferred, to be superior to common hereafter issued.

Williamstown & Delaware River.—The greater part of the grading on the extension of this road from Glassboro, the present terminus, to Mullica Hill, N. J., about seven miles, has been completed, and the tracklaying is expected to be completed by May. T. H. Thomas, Mullica Hill, N. J., has the contract.

TRAFFIC AND EARNINGS.

Railroad Earnings.

The earnings and expenses of the New York, Lake Erie & Western for the month of January and for the four months, October to January, are as follows:

Month of January:	1888.	1887.	Inc. or Dec.	
Gross earnings	$1,890,182	$1,888,060	I.	$2,123
Working expenses	1,357,848	1,358,887	D.	1,038
	$532,334	$529,173	I.	3,161
Less proportion due leased lines	171,755	182,990	D.	11,235
Net earnings	360,579	346,183	I.	14,396

Four months, Oct. 1 to Jan. 31:	1887-88.	1886-87.	Inc. or Dec.	
Gross earnings	$9,063,237	$8,775,703	I.	$287,534
Working expenses	6,010,536	5,655 239	I.	355,297
	$3,052,701	$3,120,464	D.	67,763
Deduct proportions due to leased lines, which are worked on a percentage of earnings	822.411	802,113	I.	20,298
Net earnings	$2 230,290	$2,318,351	D.	$88,061

The report of the Philadelphia & Reading for January is as follows:

	1888.	1887.		
Gross earnings	$9. 0.240	$1,570.821	D.	$640,580
Op. expenses	829.598	845,113	D.	14.914
Net earnings	$100,642	$725,708	D.	$625,666
Coal and Iron Company:				
Gross earnings	$332,827	$1.037,750	D.	$704,923
Op. expenses	506,482	1.014,023	D.	507.541
Loss	$173,654	pft. $23,727	I.	$197,382
Both companies:				
Gross earnings	$1,263,067	$2,608.571	D.	$1,345,504
Loss	73,012	pft. 749,435	I.	822,448

Both companies—two months of the fiscal year:

	1888.	1887.		
Gross earnings	$4,552.226	$5,527,890	D.	$975,664
Net earnings	674,415	1,396.078	D.	721,663

The earnings of the Illinois Central for the month of December are as follows:

Month of Dec:	Freight.	Passenger.	Misc'lan'us.	Total.	Miles.
1887	$799,816	$218,865	$137,623	$1,156,304	1,953
1886	883,809	216,682	161.583	1,262,074	2,066
12 months, Jan. 1 to Dec. 31:					Average. Miles.
1887	8,668,171	2,664,057	1,701,155	13,033,384	2,254¼
1886	8,33?,151	2,529,632	1,667,711	12,529,493	2,066

The Dubuque & Sioux City reports its gross earnings for the month of December, 1887, as follows:

	Dubuque & Sioux City, 143 miles.	Cedar Falls & Minnesota, 76 miles.	Both roads, 219 miles.
Freight	$61,476	$6,153	$67,629
Passengers	16,192	2,651	18,842
Miscellaneous	3,487	916	4,403
Total	$81,155	$9,720	$90,874

The statement of the Illinois Central for January is as follows:

	Freight.	Passenger.	Miscel'ous.	Total.	Miles.
Jan., 1888, estimated	$582,070	$188,435	$118,400	$888,905	1,953
Jan., 1887, actual	731,518	198,126	148,664	1,078,308	2,355

The earnings and expenses of the Norfolk & Western for the month of January are reported as follows:

	1888.	1887.	Increase.	P.c.
Pass., mail and exp.	$70,876	$46,902	$23,974	51
Freight	309,925	232,403	77,522	33
Gross earnings	$380,801	$279,305	$101,496	36
Exp., including taxes	222,166	177,120	45,046	25
Net earnings	$158,635	$102,185	$56,450	55
Per cent. of expenses	58	63		

The following is a statement of the Grand Rapids & Indiana for the year 1887:

	1887.	1886.
Gross earnings	$2,361,501	$2,098,126
Expenses	1,516,997	1,338,862
Net earnings	$844,904	$759,264
Add profit Mackinaw Trans. Co	5,629	1,328
Total net income	$850,533	$760,593
Interest on bonds	715,600	715,600
Advances to leased roads	8,646	30,806
Surplus	$126,287	$14,187
Increase in net earnings		85,640
Increase in surplus		112,100

The annual statement of the Northern Central for the year 1887 is as follows:

	1887.	1886.		
Gross earnings	$6,212,936	$5,684,976	I.	$527,960
Operating expenses	4,139,441	3,733,432	I.	406,009
Net earnings	$2,073,484	$1,951,534	I.	$121,950

Earnings of railroad lines for various periods are reported as follows:

Month of January:

	1887.	1886.	Inc. or Dec.		P.c.
Balt. & Potomac.	122,498	107,127	I.	15,371	14.0
Net	47 948	30.981	I.	16,967	54.7
Cent. of Georgia.	668,998	522,691	I.	146,307	29.1
Net	234,059	147.534	I.	87,525	58.4
C., I., St. L. & C.	203,392	216 168	D.	12,776	5.8
Net	70,773	87,801	D.	17.028	19 6
Keok. & West	29.200	24.545	I.	4.655	18.7
Net	7.827	8,783	D.	956	10.9
Summit Branch	156,973	86,311	I.	70,662	82.2
Net	30,951	Def. 1.594	I.	32,545	...
Lykens Valley	99,342	46,924	I.	52,418	111.6
Net	Def. 7,864	Def. 15,233	I.	7,369	49.1
N. Y., L. E. & W.	1,890,182	1,888,060	I.	2,122	0.2
Net	360,579	346,183	I.	14,396	4.1
North. Central	452,441	514,947	D.	62,506	12.2
Net	128,247	230,225	D.	101,978	48.7
Rich.& W. P. Ter. Co.:					
Rich. & Dan	389,759	341,039	I.	48,720	14.0
Net	178,633	167,794	I.	10,839	6.4
Virginia Midl.	125,832	110,281	I.	15,551	14.1
Net	42,984	36,185	I.	6,799	18.9
Char.,Col.& A.	84,257	68,576	I.	15,681	22.7
Net	41,522	36,176	I.	5,346	14.9
Col. & Gr. Div.	57,864	44,383	I.	13,481	30.6
Net	28,977	15 333	I.	13 644	91.0
W.N.Car. Div.	50,674	49,949	I.	725	1.4
Net	4,891	11,582	D.	6,691	55 8
Wash.,O.& W.	7,010	7,527	D.	517	6.9
Net	Def. 1,914	2,333	D.	4,247	184.6
Total System	715,396	621,755	I.	83,641	13.4
Net	295,092	269,403	I.	25,689	9.5
Total (gross)	$3,338,422	$1 140,468	I.	$309,894	28.1
Total (net)	1,167,613	1,104,083	I.	195,430	17.9
			D.	131,900	...
Net			I.	63,530	5 8

Month of December:

	1887.	1886.	Inc. or Dec.		P.c.
Eliz.,Lex.& B. S.	99,321	80,846	I.	18,475	23.1
Net	30 302	30.849	D.	547	1.2
Lake E. & W.	161,879	162,390	D.	511	0.3
Net	57,589	34,291	I.	23,298	72.6
Minn., S. S. & A.	23,933	15,690	I.	8,243	51.5
Net	3,436	7,062	D.	3,626	51.8

Three months to Jan. 31:

	1887.	1886.	Inc. or Dec.		P. c.
Lake S. & M. S.	5,209.730	4,648,504	I.	561,226	12.0
Net	2,067,733	2,061.865	I.	5,868	0.3
N. Y., O. & West.	458,758	379,357	I.	79.401	20.9
Net	103 012	76,764	I.	26.248	34 1
Og. & L. Champ.	190 635	183,131	I.	7.504	4.2
Net	61,969	78,352	D.	16,383	21.0

Four months to Jan. 31:

N. Y., L. E. & W.	9,063,237	8,775,703	I.	287,534	3.3
Net	2,230,290	2,318,351	D.	88,061	3.8
Rich. & W. P. Ter. Co:					
Rich. & Danv.	1,798,188	1,565,295	I.	232,893	14.6
Net	915,990	768,496	I.	147,494	19.2
Va. Mid. Div.	558.065	510.182	I.	47.883	9.6
Net	226,028	172 286	I.	53,742	31.6
Char., C. & A.	372,995	313,013	I.	59,982	19.3
Net	203,755	162,182	I.	41,573	26.0
Col. & Gr. Div.	257,683	240,736	I.	16.947	7.1
Net	116,342	108,224	I.	8 118	7.4
West. N. C. Div	216,054	193.148	I.	22.906	12.1
Net	31,703	30,190	I.	1,513	5.0
Wa., O. & W.	37,578	36,837	I.	741	2.0
Net	2,683	12,848	D	10,165	78.2
Total (gross)	$12,303,800	$11,634,915	I.	$668,885	5.6
Total (net)	3,726,792	3,572,577	I.	252,441	7.0
			D.	98,226	...
Net			I.	154 215	4.3

Five months to Jan. 31:

Cen. of Georgia.	3,789.851	3,248,826	I.	541,025	16.4
Net	1,679,760	1,418,975	I.	260,785	18.6

Seven months to Jan. 31:

C., I., St. L. & C.	1,610,419	1,605,163	D.	4,744	0.3
Net	605,377	642,698	D.	37,321	5.8

Year to Dec. 31:

Chi. & Alton	8,941,386	8,060,639	I.	880,747	11.0
Net	5,270,202	4,650,955	I.	619,247	13.2
Cin., N. O. & T. P.	3,377,552	2,882,172	I.	495,380	17.1
Net	1,342,980	1,128,292	I.	214,688	19.5
Del., Lack. & W.	39,845,857	32,342,865	I.	7,502,992	23.4
Net	8,341,796	7,224,403	I.	1,117,393	15.8
Eliz.,Lex. & B. S.	1,115,073	937 528	I.	177,545	18.9
Net	408,855	327,621	I.	81,234	24.6
Min., S. S. & A.	190,478	92,709	I.	97,769	105.1
Net	49,094	42,173	I.	6,921	16.5

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

Coal.

The coal tonnages for the week ending Feb. 25 are reported as follows:

	1888.	1887.	Inc. or Dec.		P. c.
Anthracite	654,352	643,973	I.	10,379	1.6
Bituminous	296,992	288,801	I.	8,191	2.8

The coal tonnages of the Pennsylvania road east of Pittsburgh and Erie, for the week ending Feb. 18, and the year to that date, are reported as follows:

	Coal.	Coke.	Total.
Total week ending Feb. 18	217,826	85,451	303,277
Total year 1888 to date	1,573,570	568,163	2,141,733
Total year 1887 to date	1,372,402	615,581	1,987,983

The Cumberland coal trade for the week ending Feb. 18 amounted to 62,208 tons, and for the year to that date, 460,489 tons.

East-bound Shipments.

Following is the statement of freight east from Chicago for the month of January:

	Tons.	P. c.
Chicago & Grand Trunk	34,527	16 87
Michigan Central	41 657	20.41
Lake Shore & Michigan Southern	35,041	17.13
Pittsburgh, Ft. Wayne & Chicago	36,508	17.84
Chicago, St. Louis & Pittsburgh	17,659	8.63
Baltimore & Ohio	22,183	10.84
New York, Chicago & St. Louis	15,528	7.59
Cin., Ind., St. Louis & Chicago	1,413	0.69
Grand total	204,620	100.00

LIVE STOCK.

	Tons.	P.c.
Chicago & Grand Trunk	3.676	3.82
Michigan Central	22.830	23 70
L. S. & M. S.	29,830	30.11
P., Ft. W. & C.	11,348	11 78
C., St. L. & P.	2,727	2.83
Baltimore & Ohio	3.945	4.10
N. Y., C. & St. L.	22,783	23.66
Grand total	96,314	100.00

The Chicago & Grand Trunk, which for years has carried fully 50 per cent. of the dressed beef, has reduced to 4 per cent., while the Lake Shore and the Nickel Plate make corresponding gains.

Cotton.

The cotton movement for the week ending Feb. 24 is reported as follows, in bales:

	1888.	1887.	Inc. or Dec.		P. c.
Interior markets:					
Receipts	39.490	42,934	D.	3.444	8.0
Shipments	49,317	63.101	D.	13,784	21.9
Stock	350,614	301,199	I.	49,415	16.4
Seaports:					
Receipts	69,024	95,013	D.	25,989	27.4
Exports	100,130	84,830	I.	15,300	18.0
Stock	868,631	863,361	I.	5,270	.6

The Inter-state Commerce Commission.

On Feb. 23 an opinion was given in the case of George Rice, of Marietta, O., vs. the Louisville & Nashville and several other roads, charging among other things discrimination in favor of the Standard Oil Co. The opinion says:

The complainant's method of shipment was in barrels. This was the only method for which any of the defendants supplied rolling stock to their patrons. The Louisville & Nashville and the Cincinnati, New Orleans & Texas Pacific had each a few tank-cars, but the tanks upon them were owned by the Standard Oil Company, of Kentucky, and they were not obtainable by others. Parties desiring to ship oil in bulk by tank-cars could only do so by procuring and tendering to the railroad companies the cars for transportation. The defendants by their rate-sheets gave rates on oil in barrels, and to many towns, but not all, on oil in tanks also. Generally the rates on the transportation of oil in tanks were car rates, but in some cases they were by the hundred pounds. The rate-sheets gave no information as to how tank-cars were to be obtained.

The commission decides that it was the duty of the defendants to publish information on this subject with their rate-sheets, and that they did not fully give the information regarding rates which the law intends shall be placed before the public unless they did so. It is obvious that instead of the defendants offering two methods of transportation which are open to the acceptance of all they offer only one which is so open. The other is offered on such terms that it can be accepted only by parties who can control a considerable capital, and who will supply for themselves an important part of the means of transportation, and also supply terminal facilities. The man of small means who transports in barrels cannot be said to do so of choice when the failure of the carrier to supply for the other the customary means of transportation compels him to do so. It does not seem to us either just or plausible to say, under such circumstances, that the person whose oil is carried in barrels has voluntarily chosen that method, and has no concern with the charges imposed on his competitor, who adopted the other. He is, on the contrary, vitally concerned with those charges, and if his own are not to be gauged in some degree by them, he may be ruined in his business without redress, even though the charges he pays, when considered by themselves, may seem not unreasonable.

The commission lays down the general rule that the tank is to be considered a part of the car itself, and for whatever is carried in it the charge ought to be the same by the hundred pounds as is made on the transportation of barrels of oil in car-load lots in other cars. Even then the shipper of barrels is at some disadvantage, for he must pay freight on the caskets as well as on the oil; but this, as between him and the carrier, is not unjust. This ruling does not preclude such allowance for use of tank cars as is customary, provided it be reasonable, but it assumes that such allowance will be made. But it should be made on some system, by some rule of uniformity, and the authority to make it must not, carelessly or otherwise, be made a means of discrimination.

The case of each of the defendants was considered separately, and in the case of the Louisville & Nashville an order was entered that defendant cease unjust discrimination, cease to make tank rates when the tanks differ in capacity, and conform the charges on tank, car and barrel shipments to the rule above prescribed. In the case of the St. Louis, Iron Mountain & Southern the Commission finds that the defendant made excessive rates on barrel shipments and that the effect was to unjustly discriminate against complainant and to give undue and unreasonable preference to shippers by tank cars. An order was entered that its charges be corrected and made to conform to the rule. In the other three cases—the Mobile & Ohio, Mississippi & Tennessee and Illinois Central—no orders were entered. The Commission states that, while the questions raised by the charges are important, they scarcely received any attention, either in the taking of the evidence or in the arguments which were made on behalf of the complainant. A decision upon them would affect other parties quite as much as it would the parties now before the Commission, and under such circumstances it would be impossible to pass upon them now.

The Commission met in New York Tuesday and began the investigation of the west-bound emigrant rates on tickets sold at Castle Garden, New York. J. C. Savery, of the American Emigrant Co., asserts that the Inter-state law has been violated, as ticket agents in the Garden sell immigrant tickets for $13, while outside they are sold for $17. Discrimination in freight rates is also charged. All the principal railroads were represented by counsel, who deny the charges. Mr. Blair, for the complainants, claimed that the railroads would not allow the immigrants to send their baggage by freight. Supt. Henry I. Jackson, of Castle Garden, said that since the formation of the pool the emigrants have not been consulted as to which road they wish to go by. About 40 per cent. of the passengers landed at the Garden go by the trunk lines to the West.

On Wednesday Passenger Commissioner Pierson testified concerning the methods of the roads. The joint expenses of the roads at Castle Garden are $1.72 per passenger. The complainant, who is an "emigrant agent," is refused admission to Castle Garden, and this refusal seems to be the reason for his present action. He sends all his passengers by the New York, Ontario & Western, receiving a commission of 10 per cent. He has no partners, the "American Emigrant Company" being merely a name.

Traffic Notes.

The Kansas City, Fort Scott & Gulf has made a general reduction in freight rates of about 50 per cent. This action was taken, it is said, to meet the reduction made by the Missouri Pacific in that territory.

The Chicago & Northwestern, Chicago, Milwaukee & St. Paul, and Chicago, Rock Island & Pacific have withdrawn from the California Fast Freight Line

The complaints of the Commercial Exchange, of Philadelphia, against the trunk lines, for alleged discrimination by means of underbilling, have been presented to the Inter-state Commerce Commission. The roads and lines against which the complaints are made are: Cleveland, Columbus, Cincinnati & Indianapolis, Philadelphia & Reading, Cincinnati, Indianapolis, St. Louis & Chicago, New York, Chicago & St. Louis, Indiana, Bloomington & Western, Pennsylvania, Pittsburgh, Cincinnati & St. Louis, White Line, Erie Dispatch, Traders' Dispatch and Union Line.

The Colorado & Utah Railroad Association has been reorganized under the name of the Colorado Railroad Association. H. L. Rich is chairman, with office at Denver.

The low rates in the West continue and no progress toward a settlement is reported. The important reductions made in through rates from Iowa and Nebraska points through to the seaboard and Europe continue to be a chief topic of interest; the Pennsylvania is accused of being the foremost actor in this movement.

ANNUAL REPORTS.

The following is an index to the annual reports of railroads companies which have been reviewed in previous number of the current volume of the *Railroad Gazette:*

Baltimore & Ohio	48	Northern Central	132
Buffalo, Rochester & Pittsburg	64	Richmond & Danville	64
Fitchburg	32	Rome, Watertown & Ogdens	16
Lehigh Valley	98	St. Louis, Vandalia & T. Haute	64
Norfolk & Western	98	Wrightsville & Tennille	32

Delaware, Lackawanna & Western.

This company makes the following report of results of operation for the year ending Dec. 31, 1887:

	1887.	1886.	Increase.	P. c.
Gross earnings	$39,845,857	$32,342,865	$7,502 992	23.4
Operating expenses. R. R., mines, etc	30,694,000	24,954,433	5,739,567	23.2
Net earnings	$9,151,857	$7,388,432	$1,763,425	23.7
Interest and rentals	5,203,420	5,186,711	17,609	0.3
Balance	$3,948,437	$2,201,721	$1,746,716	79.4
Less new rolling stock and side tracks	810,061	164,030	646,031	....
Net profit	$3,138,376	$2,037,691	$1,100,685	54.0
Interest on capital stock of $26,200,000	11.27 p. c.	7.77 p. c.		

Property and Assets:	1887.	1886.
Construction account end of preceding year	$34,496,431	$34,508.047
Add for new buildings, etc	172,794	...
Deduct old cars destroyed	...	11,616
	$34,669,226	$34.496,431
Materials	1,246,976	1,221,174
Stocks and bonds	5,735,779	4,770,654
Balance of cash and accounts	1,037,985	897,331
	$42,689,966	$41,385,591
Stocks, Bonds and Surplus:		
Capital stock	26,200,000	26,200,000
Bonded debt	3,674,000	3,674,000
Surplus account Dec. 31, 1887	12,815,996	11,511,591
	$42,689,996	$41,385,591

Chicago & Alton.

This company reports for the year ending Dec. 31, 1887. The mileage operated was: main track, 849; second track, 64; side track, 199; total miles 1112, an increase for the year of 8 miles of side track. The equipment comprised 228 locomotives, 150 passenger cars, 7047 freight cars of all classes. Twelve passenger and mail cars and 200 coal cars were built during the year.

The earnings for the year were:

	1887.	1886.	Inc.	P. c.
Passenger	$2,474.154	$2,311,041	$163,113	7.1
Freight	6,070,639	5,392,059	678,581	12 6
Express	172,150	163,069	9.081	5 6
Mail	148.517	136,042	12,475	9.2
Miscellaneous	75,926	58,429	17,496	29.9
Total	$8,941,386	$8,060,639	$880.747	10 3
Op. expenses	5,270,203	4,650,955	619,248	13.3
Net earnings	$3,671,183	$3,409,684	$261.499	7.7
Gross earn. per m.	10,532	9,493	1,039	10.9
Net earn. per mile.	4,324	4 016	308	7.7
P. c. of op. exp.	58.9	57.7		

The operating expenses were distributed as follows:

	1887.	1886.	Increase.	P. c.
Conduct. transportation	$1,588,025	$1.476,955	$111,071	7 5
Motive power	1,420,268	1,355,552	64,715	4.8
Maintenance of way	1,599,543	1,337,541	262,002	19.6
" " cars	662,367	480,907	181,460	37.7
	$5,270,203	$4,650,955	$619,248	13 3

The income account was:

Balance, Dec. 31, 1886		$2,775,220
Interest on securities, etc		269,239
Gross earnings		8,941,386
		$11,985,845
Interest	$831,031	
Dividends (8 per cent.)	1,407,644	
Rentals	710,608	
Sinking fund bonds	92,672	
Additions to property and new tracks	270,971	
Unexpended balance of appropriations for imp., etc	386,473	
Op. expenses	5,270,203	
Balance	$3,016,243	
		$11,985,845

Some traffic statistics were as follows:

	1887.	1886.	Inc. P. c.
Passengers carried	1,765,196	1,735.549	1.7
Passenger-miles	120,001,687	114,250,157	5.0
Distance traveled per pass	67.9b miles.	65 83 miles.	2.2
Rate per mile	2.062 cts.	2,022 cts.	1 98
Passengers per train-mile	68.83	66.35	3.7
Tons freight	4.123.120	3,651,100	12.9
Ton-miles	641,651,562	560,824,279	14.4
Rate per ton-mile	0.946 cts.	0.961	D. 1.56
Distance each ton carried	155.6 miles.	153.6	1.31